DRAFT ENVIRONMENTAL ASSESSMENT

PROPOSED RECYCLE PAPER TISSUE MILL
SOUTHEAST TISSUE COMPANY, LLC

**REQUEST FOR APPROVAL OF SALE OF PROPERTY
IN THE BARTON RIVERPORT INDUSTRIAL PARK,
SECTION 26a APPROVALS AND EASEMENTS,
AND CLEAN WATER ACT SECTION 404
AND RIVERS AND HARBORS ACT SECTION 10 PERMITS**

PICKWICK RESERVOIR
TENNESSEE RIVER MILE 242L
COLBERT COUNTY, ALABAMA

TENNESSEE VALLEY AUTHORITY

June 2002

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LIST OF ACRONYMS

7Q10	the minimum 7-day low flow that occurs once in 10 years
AADT	annual average daily traffic
ACGIH	American Conference of Governmental Industrial Hygienists
ADCNR	Alabama Department of Conservation and Natural Resources
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ALDOT	Alabama Department of Transportation
ALNHP	Alabama Natural Heritage Program
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
C	Celsius
CBOD	Carbonaceous Biochemical Oxygen Demand
CCC	Criterion Continuous Concentrations
cfm	cubic feet per minute
cfs	cubic feet per second
CO	carbon monoxide
dB(A)	decibel (A-weighted)
DDT	dichlorodiphenyltrichloroethane
DO	dissolved oxygen
EA	Environmental Assessment
EDL	Economic Development Loan
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETR	endangered, threatened, and rare
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
fps	foot per second
FWS	Fish and Wildlife Service
GPM	gallons per minute
HAP	Hazardous Air Pollutants
HDPE	high density polyethylene
hp	horsepower
LC_{50}	Lethal Concentration that will result in 50 percent survivorship of the test organism
Ldn	day-night average A-weighted sound level
MACT	Maximum Achievable Control Technology
MGD	million gallons/day
mg/L	million grams per liter
MMBtu	million British thermal units
msl	mean sea level
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NOx	nitrogen oxides

LIST OF ACRONYMS (Continued)

NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NRWQC	National Recommended Water Quality Criteria
NWR	National Wildlife Refuge
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
PSD	Prevention of Significant Deterioration
SEDA	Shoals Economic Development Authority
SIC	Standard Industrial Classification
SID	State Indirect Discharge
SO2	sulfur dioxide
SWPP	Stormwater Pollution Prevention
TLV	Threshold Limit Value
TNC	The Nature Conservancy
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
TRM	Tennessee River Mile
TVA	Tennessee Valley Authority
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VOC	volatile organic compounds

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1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 THE PROPOSED FEDERAL ACTIONS

The Tennessee Valley Authority (TVA) proposes the following actions along the left bank of Pickwick Reservoir at about Tennessee River mile (TRM) 242 in Colbert County, Alabama:

- Grant approval for the Shoals Economic Development Authority (SEDA) to sell approximately 820 acres of the Barton Riverfront Industrial Park site to Southeast Tissue Company LLC (Southeast Tissue) for construction and operation of a recycle furnish tissue and converting mill, and
- Grant approvals under Section 26a of the TVA Act and transfer permanent industrial easements for the proposed mill's raw water intake and a wastewater outfall crossing TVA property and extending into the navigation channel of the reservoir at approximately mile TRM 241.8.

- Grant approval under Section 26a of the TVA Act for a crossing of Whitley Branch, a small perennial stream about two miles south of the site, by the access road to the site.

In addition, the United States Army Corps of Engineers (USACE) proposes to issue individual permits for the intake and outfall under Section 404 of the Clean Water Act and Section 10 of the River and Harbors Act and a nationwide Section 404 permit for the crossing of Whitley Branch.

The general location of these actions is shown in Figure 1.1-1, and the detailed locations are shown in Figure 1.1-2.

1.2 PURPOSE AND NEED

The proposed action has two purposes. One purpose is to enable Southeast Tissue to produce and convert tissue, towel and napkin grades of paper utilizing 100% recycled furnish (i.e., water paper, post consumer waste, newsprint, corrugate) operating under Standard Industrial Classification (SIC) groups of 2621 (primarily engaged in manufacturing paper) and 2679 (primarily engaged in manufacturing miscellaneous converted paper). The new mill would support Southeast Tissue's business strategy. It would provide Southeast Tissue with the additional internal paper manufacturing capacity needed to support its current sales plan. It

would also improve the company's supply chain network by locating a large portion of its paper making and converting assets within the geographic region where important sales potential exists. These improvements to Southeast Tissue's cost position would solidify the company's economic and competitive viability.

The second purpose of the proposed action is to benefit the economy of the Shoals area. In recent years the area has suffered the loss of numerous high-wage jobs as several large manufacturing companies have reduced staff or closed. The jobs provided by Southeast Tissue would help offset these losses.

1.3 PREVIOUS ENVIRONMENTAL REVIEWS AND DOCUMENTATION

The upland part of the site for the proposed mill has previously undergone environmental review. TVA prepared two National Environmental Policy Act (NEPA) Environmental Assessment(s) (EAs) to assist the SEDA to purchase 1,604 acres of land to be developed as the Barton Riverfront Industrial Park (TVA, 1997 and 1999). The proposed mill site lies within this industrial park. The proposed action for the 1997 EA was a TVA loan to SEDA for the purchase and development of 1,284 acres for the industrial park. SEDA would prepare a marketing plan and materials, market the site to attract industries, erect signs identifying the site, and remodel the "Gilbert" house on the site for use in marketing efforts.

The 1999 EA covered three actions:

- To allow SEDA to use the existing loan funds to refinance the purchase of two parcels of land known as the McWilliams property and the Blankenship property, approximately 320 acres along the eastern border of the original 1,284 acres.
- To issue a Section 26a approval for the development of a port facility on the Tennessee River at TRM 244.0L and extending downstream approximately 1,300 feet.
- To approve a permanent industrial easement for an access road and approximately 20 acres of TVA property needed to develop the port.

Environmental studies by TVA staff and two Cultural Resource Surveys conducted by the University of Alabama for TVA (University of Alabama, 1989 and 1998) were used in preparing the EA's.

A Finding of No Significant Impact (FONSI) document was published by TVA for each of the proposed actions evaluated in the previous EAs (TVA, 1997 and 1999). These FONSIs concluded that the potential environmental consequences of the proposed actions were adequately addressed by the EAs, and the proposed actions would not be major federal actions significantly affecting the quality of the environment. These FONSIs stipulated that the proposed actions were subject to several mitigation measures. Those mitigation measures that are related to the development of the property and facilities for the proposed Southeast Tissue Mill include:

- Prior to approving the location of an industry at the Barton site, SEDA shall submit a plan for site infrastructure and development standards for the site to TVA for review and approval. Development standards shall address impacts of industrial use of the park on environmental resources and specify methods for mitigating those impacts.
- SEDA shall incorporate the development of the property and proposed infrastructure into the development standards and plans being developed for the site which TVA would review for approval.

1.4 SCOPING

The alternatives to be evaluated and the issues to be addressed, or scope of this EA, were determined by TVA with cooperation of the USACE based on analysis of public comment, the previous EAs dealing with the site, professional judgment of agency staff, and discussions among staff of TVA, USACE, Southeast Tissue, Southeast Tissue's environmental consultant Earth Tech, and local and state governmental agencies.

1.4.1 Public Scoping

The proposed project was initially announced and comments requested through a paid announcement published in the local newspaper, The Florence Times Daily, on February 23, 2002. The announcement also informed the public that a public meeting would be held on February 26, 2002, to provide information about the proposed action and to receive comments. One hundred six people registered as attendees.

A followup article on the project and the meeting was published in the Times Daily on February 25, 2002.

The public provided 113 comments during the comment period, which expired on March 20, 2002. The specific comments dealt with air quality, socioeconomic issues, land use, groundwater, water usage, terrestrial and aquatic ecology, noise, archaeology and history, wetlands, visual resources, floodplains, and there were a number of general comments unrelated to any particular environmental issue. Most commenters were in favor of the project. They expected that there would be no adverse environmental impacts of concern and appreciated the economic benefits to the area from the new jobs.

Some commenters were concerned about the following possible environmental impacts of the project:

- wastewater from the mill subjecting the swimming and fishing area at the mouth of Mulberry Creek just downstream of the site to unhealthful or objectionable levels of effluent
- toxic constituents of wastewater harming the important bass fishery of the reservoir
- typical objectional “paper mill odors”
- noise from the mill
- “misuse” of the site for landfilling solid waste from the mill
- impacts on groundwater from waste injection wells and leakage from the landfill or wastewater treatment ponds
- lessening of scenic quality due to the presence of the facility

TVA and USACE also invite public comments on the draft EA. A notice of availability of this draft EA has also been placed in the Florence Times Daily, with a public comment period of thirty days from the date of publication of the notice in the paper. Copies have also been sent to

the local libraries, and the Draft EA has been placed on TVA's Internet site at http://www.tva.gov/environment/reports/SETissue.htm.

1.4.2 Issues To Be Addressed In Detail In This EA

Based on the comments received, staff discussions, and professional judgment, TVA determined that the following issues would be addressed in detail in the EA:

- effects on water quality in Pickwick Reservoir; including sediment levels, chemistry, temperature, dissolved oxygen, nutrients, and color, particularly in the area around the site, including the swimming area;
- effect on quality of the sediment on the reservoir floor,
- effects on floodplains,
- effect on wetlands,
- effect on groundwater,
- effect on air quality,
- effect on terrestrial ecology,
- effect on aquatic ecology,
- effect on endangered, threatened, and rare species,
- effects on socioeconomic conditions: including population, housing, employment income, infrastructure, community facilities, recreation, and environmental justice,
- effects of noise on people and wildlife
- effect on archaeological and historical resources,
- and effects on visual quality.

Effects of both construction and operation of the facility would be addressed. Indirect and cumulative effects, unavoidable adverse environmental effects, the relationship between short-term uses and long-term productivity, and irreversible and irretrievable commitment of resources would also be considered.

As discussed in Chapter 2, Southeast Tissue intends to construct the facility in six phases. The first four phases have firm plans and would take between three and four years to complete. The final two phases are tentative and could take place over another 10 to 15 years. The facility is economically feasible only if the first four phases are completed, so Southeast Tissue has applied for all environmental permits at this level of production and discharges to ensure that

they can be built. Because the last two phases would increase production and discharges by the same amount as the first four phases and because the company intends to complete all six phases eventually, TVA and USACE have determined that they are all reasonably foreseeable and must be reviewed in this EA.

1.4.3 Issues of Minor Importance

TVA determined that certain issues needed only brief treatment because of the nature of the site or project, or because the use of standard measures would reduce impacts to negligible levels. The nearby small waterbodies of Mulberry Creek and Cane Creek would be affected only by stormwater runoff from the site, and this runoff would be well-controlled by standard best management practices. Whitley Creek would be affected only by a short length of culvert for the access road to the site, and the standard measures in the 26a approval for controlling sedimentation and other impacts would result in negligible impacts.

Another issue needing only brief treatment is potential effects on river flow and water supply. At ultimate buildout, the facility would withdraw 11 million gallons of water per day (11 MGD) from Pickwick Reservior, but would only consume about 5% of that (about 0.55 MGD) due to evaporation and water contained in deinking sludge. The remaining 10.5 MGD would be returned to the reservoir after treatment. Even the full withdrawal would be only 0.15% of the 7Q10 flow of the river or 0.032% of the average annual flow of the river, so the much smaller consumptive use would have negligible impact on the flow of the river and availability of water for water supply downstream. (Because consumptive use is so small and because some of the consumptive use would be replaced by slightly increased stormwater runoff from the increased impervious surfaces of the facility, for simplicity, this EA generally considers that the wastewater return to the river is equal to the withdrawal.)

1.4.4 Alternatives to be Evaluated in Detail in this EA

Based on the public comments received, staff discussions, and professional judgment of agency staff, TVA determined that two alternatives, with two sub-alternatives, would be addressed in detail in the EA.

No Action Alternative – Under this alternative, TVA and the USACE would not provide the approvals or permits. Southeast Tissue would not build and operate its proposed facility in the Barton Riverfront Industrial Park.

Proposed Action Alternative – Under this alternative, TVA and the USACE would provide the approvals and permits as requested with mitigation as necessary to reduce impacts. Southeast Tissue would build and operate its proposed facility in the Barton Riverfront Industrial Park.

Sub-Alternatives for Landfill Disposal for Deinking Sludge – Under the Proposed Action Alternative, the sludge produced in deinking the waste paper would have to be placed in a landfill. This landfill could be on site or the waste could be taken to an existing landfill offsite.

1.4.5 Alternatives Considered but not Evaluated in Detail in this EA

Alternative Facility Sites – Before proposing to locate in the Barton Riverfront Industrial Park, Southeast Tissue evaluated a number of potential sites in several states within their proposed market area, considering the environmental impact, in addition to physical, logistical, and economic constraints, of each alternative project site location.

The following criteria were used to evaluate potential sites:

Criterion 1 – The water supply must be capable of providing a full build-out water use for the mill of approximately 11 MGD.

Criterion 2 – The location must either have a nearby Publicly Owned Treatment Works (POTW) with available treatment capacity at a reasonable cost, or provide a receiving stream with adequate assimilative capacity.

Criterion 3 – The potential site must be located in an area that is currently in attainment and is reasonably expected to remain in attainment for criteria air pollutants.

Criterion 4 – The potential site must have at least 700 to 1,000 acres of reasonably level topography to accommodate full project build-out.

Criterion 5 – The potential site must be reasonable close to good primary roads and rail lines for shipment of product and receipt of waste paper furnish for papermaking.

Criterion 6 – The proposed site must accommodate the delivery of a Yankee Dryer, either by river with sufficient depth for a barge/boat or by rail with sufficient and overhead clearances for delivery of the dryer.

Criterion 7 – The property for the site must be offered in such a manner so that options to purchase could be secured in a reasonable time frame (i.e., a reasonable number of property owners).

Criterion 8 – Environmental protection requirements must be met at the site, as determined through the feasibility of obtaining air, wastewater, stormwater, process water, wetland/navigable water, and solid waste permits, and the ability to obtain a Finding of No Significant Impacts after completion of an Environmental Assessment under NEPA.

Three potential sites were identified for further evaluation. These three sites were located in northeastern North Carolina on the Roanoke River, southeastern Georgia on the Altamaha River, and at the Barton Riverfront Industrial Park site in Alabama. Acquisition of an existing facility was considered as well as building a new facility. However, no suitable acquisition facility could be identified, leaving no alternative but constructing a new facility on an undeveloped site.

Southeast Tissue evaluated each of the three alternative sites located in North Carolina, Georgia, and Alabama based on the eight criteria summarized in Section 2.3.1. The results of these evaluations for each criterion are provided in Table 2.3-1.

The Georgia site was eliminated by the company as an alternative primarily because the Altamaha River does not have sufficient assimilative capacity to receive treated wastewater from the proposed facility, and thus, wastewater discharge permitting is not feasible. Additionally, transportation of a Yankee Dryer on the river by barge to a docking location in the vicinity of the prospective mill location is not feasible because of the shallow water depth of the river channel in the vicinity of the site.

Southeast Tissue has not eliminated the North Carolina site from consideration as an alternative location for the proposed facility. However, one reason that this location is not preferred is that water intake and wastewater outfall permit conditions would be more restrictive due to lower river flows and the existing water quality conditions in the river. Additionally, required permits and approvals cannot be obtained in time to meet the intended project construction and operation schedule.

Southeast Tissue selected the Alabama site at the Barton Riverfront Industrial Park as the location of the proposed facility because this location appeared to best meet all siting criteria requirements.

Based on these results of Southeast Tissue's siting process, TVA has determined that none of the other potential sites is likely to result in less impact to the environment. Also, though the North Carolina site may be useable for Southeast Tissue at some later time, if permits can be obtained, that site is outside the TVA region and therefore not subject to TVA jurisdiction and involvement, nor would a mill there benefit the economy of the Shoals area. Therefore, this EA does not evaluate alternative sites further.

Alternative Locations for Water Intake and Process Water Outfall – Southeast Tissue originally considered locating the intake and outfall at TRM 241.71 instead of the proposed location of TRM 241.84. In response to public scoping comments expressing concern that wastewater from the mill would subject the swimming and fishing area at the mouth of Mulberry Creek just downstream of the site to unhealthful or objectionable levels of effluent, Southeast Tissue considered moving the outfall location to a location further upstream in order to further minimize the concentrations of any potential effluent constituent that would occur in the vicinity of water adjacent to Mulberry Creek where the residents swim, fish, and boat. The company evaluated four alternative outfall locations. The outfall locations evaluated were as follows:

Alternative 1(original proposal) – Outfall Location – River Mile 241.71

Alternative 2 – Outfall Location - River Mile 241.84

Alternative 3 – Outfall Location – River Mile 242.10

Alternative 4 – Outfall Location – River Mile 242.65

(The intake would be upstream of the outfall. Therefore if the outfall were to be relocated, the intake would also have to be relocated. This discussion focuses primarily on the outfall.)

Alternative 4 was eliminated because of TVA staff concerns about the interaction of the Colbert Fossil Plant intake and outfall with the proposed outfall during low flow conditions during summer months and about a proposal intake so close to Colbert Fossil Plant that an accidental

spill or other release of material at Colbert could reach the proposed intake before any protective action could be taken.

Alternative 3 was eliminated because Southeast Tissue was unable to obtain an easement across private land at that location to allow access to the river.

For Alternatives 1 and 2, the intake and outfall piping would be installed in the same corridor, with a width of approximately 75 to 100 feet, down to the edge of the river/reservoir. At the edge of the river, for both alternatives, the intake would be angled out into the main river channel approximately 400 to 500 feet upstream of the outfall location. The outfall piping and diffuser structure would also be installed in the main river channel. The details of the installations in the main channel would be the main difference.

In Alternative 1, the outfall location would be approximately 0.12 miles (634 feet) upstream of Mulberry Creek and less than three hundred feet from the island in the swimming area used by the residents along Mulberry Creek. This would be approximately 3.41 miles downstream of the Colbert Fossil Plant intake and approximately 2.51 downstream from the Colbert Fossil Plant outfall.

For Alternative 2, the outfall would be located approximately 0.25 miles (1,320 feet) upstream of Mulberry Creek and about 925 feet upstream from the island in the Mulberry Creek swimming area. This would be approximately 3.16 miles downstream of the Colbert Fossil Plant intake and approximately 2.26 miles downstream from the Colbert Fossil Plant outfall. For this alternative, the intake and outfall piping under the riverbed would be angled more in the upstream direction; with the outfall piping extended an additional 300 feet into the main river channel. With this alternative, outfall diffuser ports would also be angled 45 degrees from the outfall piping in the direction of the right bank of the river to direct the plume further toward the right bank of the river and away from the mouth of Mulberry Creek.

To determine which alternative would have a smaller effect in the vicinity of Mulberry Creek, Earth Tech (2002) projected characteristics of the outfall plumes from both alternatives under three river flow conditions during winter and summer – the 7Q10 flow of 11,000 cubic feet per second (cfs), half that flow rate, and a still lower rate of 3,250 cfs using a Cornell Mixing Zone Expert System (CORMIX) model.

The modeling results projected that the outfall plume would intersect the left bank of the main river channel downstream from Mulberry Creek for Alternative 1 under all river flow conditions modeled. Under Alternative 2, however, the plume would intersect the left bank considerable farther downstream (not intersecting the bank at all under the lowest modeled flow conditions in summer), be farther from the residences and swimming/fishing/boating areas near Mulberry Creek, and be more dilute as it passed by the Creek. The Alternative 2 location would also be far enough downstream from Colbert Fossil Plant not to cause the intake and outfall of the proposed facility to interfere with Colbert's intake during low flows. Therefore, Southeast Tissue decided to use the intake and outfall alignments of Alternative 2, and this is the proposed action evaluated in this EA.

1.5 APPLICABLE ENVIRONMENTAL PERMITS AND APPROVALS

Construction and operation of the proposed recycle paper tissue mill would comply with all applicable federal, state, and local laws and regulations and permit requirements. In addition to the federal permits and approvals addressed for this EA, the major environmental permits/approvals required for the proposed mill are listed below.

- **Water Quality Certification** from the State of Alabama Department of Environmental Management (ADEM) in accordance with Section 401(a)(1) of the Clean Water Act.
- National Pollutant Discharge Elimination System **(NPDES) Permit for Wastewater and for Storm Water Associated with Industrial Activity** issued by the ADEM. The wastewater would consist of process wastewater, utility wastewater (boiler blow down, cooling tower blow down, steam condensate), landfill leachate, and some stormwater runoff from certain manufacturing areas of the facility.
- **General NPDES Permit for Storm Water Associated with Construction Activity** issued by the ADEM. Coverage through the submission of a Notice of Intent (NOI) under this general permit is required prior to the start of construction activity at the site, and the discharge of any storm water associated with construction activity to Mulberry Creek and/or the Tennessee River.
- State Indirect Discharge **(SID) Permit** issued by ADEM. This permit is required for an indirect discharge of wastewater from the initial converting operations of the proposed mill to the Town of Cherokee POTW.

- **Surface Water Withdrawal Registration** required by the Alabama Department of Economic and Community Affairs. This requirement involves documentation/registration of the proposed withdrawal of water from the Tennessee River.
- **Air Construction Permit** issued by ADEM for emission sources from the mill such as the boiler, paper machines, converting building, deinking operations, tanks, and other miscellaneous sources.
- **Landfill Construction/Operation Permit** issued by the ADEM. This permit is required prior to the construction and operation of a proposed on-site industrial landfill for the disposal of primary wastewater sludge generated from deinking operations and certain other solid waste material generated by the proposed mill.
- **Executive Order 11988 Flood Plain Management.** Consistent with the requirements of the Executive Order, TVA and the USACE consider the presence of floodplains and flood hazard in evaluating their proposed actions. An action in the floodplain, in this case the proposed intake and outfall, may not be approved unless there is no practicable alternative and impacts on the floodplain would be minimized.
- **Executive Order 11990 Protection of Wetlands.** Consistent with the requirements of the Executive Order, TVA, and the USACE consider the presence of wetlands on federal land in evaluating their proposed actions.
- **Section 106 of the National Preservation Act.** Under this requirement TVA and USACE must consult with the public, Indian Tribes, and the State Historic Preservation Officer regarding potential impacts to archaeological and historical resources on or potentially eligible for listing on the National Register of Historic Places.

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2.0 DESCRIPTION OF PROPOSED FACILITY AND ALTERNATIVES

2.1 FACILITY CONSTRUCTION ALTERNATIVE

2.1.1 Location of the Proposed Facility

The recycle furnish tissue and converting mill is proposed to be located at a site consisting of approximately 820 acres in Colbert County, Alabama, near the Towns of Barton and Cherokee. This site along the left bank of the Tennessee River near TRM 242 is referred to as the Barton Riverfront Industrial Park site and is presently owned and being developed by SEDA. A site location map for the proposed facility is presented in Figure 1.1-1. A proposed general layout of the site showing locations of the mill, wastewater treatment facilities, wastewater and stormwater outfall locations, a raw water intake, access roads, a railroad spur line, and possibly a landfill for full build out of the mill is presented on a U.S. Geological Survey (USGS) map for the site in Figure 1.1-2, on an aerial photograph in Figure 1.1-3, and on a facility layout drawing in Figure 1.1-4.

2.1.2 Facility Description

The proposed mill would be engaged in the production and conversion of tissue, towel and napkin grades of paper using 100% recycled furnish (i.e. waste paper, post consumer waste, newsprint, corrugate) under SIC groups of 2621 (primarily engaged in manufacturing paper) and 2679 (primarily engaged in manufacturing miscellaneous converted paper). No timber harvesting or logging activities would be associated with the proposed mill.

Facility design is ongoing, and some of the design information contained in this document is preliminary. There may be changes in the proposed specific location of facilities and other parameters as the design is finalized. State, federal, local, and other agencies involved in the approval or permitting process would be informed of any changes that impact permit applications or permit approval conditions. Any changes would undergo additional NEPA review by TVA and USACE as appropriate.

Construction is planned to occur in six phases with four separate tissue/paper machines and production levels over a 15 to 20 year period.

Phases I - VI
Construction and Operation Schedule

Construction Phase	Start of Construction	Start of Operation
Phase I – Initial Converting Only	Third Quarter 2002	1st Quarter 2003
Phase II – 1st Paper Machine and Recycle Fiber Plant	4th Quarter 2002 or 1st Quarter 2003	2nd Quarter 2004
Phase III – Additional Converting and Warehouse	1st Quarter 2003	2nd Quarter 2004
Phase IV – 2nd Paper Machine and Recycle Fiber Plant	4th Quarter 2004	2nd Quarter 2006
Phase V – 3rd Paper Machine and Recycle Fiber Plant	Not Yet Defined	Not Yet Defined
Phase VI – 4th Paper Machine and Recycle Fiber Plant	Not Yet Defined	Not Yet Defined

Phase I would consist of the initial converting building, approximately 27 converting lines, warehouses, an administration building, and maintenance facilities. Converting operations for Phase I would use parent rolls of paper from other facilities.

Phase II would include the first tissue/paper machine, the tissue/paper machine building, the first recycle fiber plant including deinking, storage for parent rolls produced in house, and a warehouse for waste paper collected to be the feedstock for the tissue. This phase would also include such supporting facilities as a boiler, the process water treatment plant with an intake in the Tennessee River, the on-site wastewater treatment plant with an outfall to the Tennessee River, and possibly an on-site landfill.

Phase III would include approximately 30 additional converting lines and a warehouse for finished products. With the installation of these converting machines, no additional converting lines would be needed until the construction of the Phase V tissue/paper machine and associated recycled fiber plant. Some parent rolls from other facilities may be used in the converting operations.

Phase IV would include the second tissue/paper machine, the tissue/paper machine building, and the second recycle fiber plant including deinking. This phase would also include any necessary modifications to supporting facilities such as the boiler, process water treatment

plant, and the on-site wastewater treatment plant. If not constructed earlier, but still needed, on-site landfill to accommodate solid waste would be constructed during this phase.

Phases V and VI would include two additional tissue/paper machines and recycled fiber plants.

As part of the papermaking operation, the furnished paper would be re-pulped and processed by screening, cleaning, and washing through a deinking facility to supply both white and brown stock to the tissue/paper machines. White pulp would be brightened using hydrosulfite (no chlorine brightening). For the Phase II tissue/paper machine, up to 60% of production would be unbrightened grades.

Converting and tissue/paper production levels for Phases I – VI are provided in the table below.

Phases I - VI
Converting and Tissue/Paper Production Levels

Phase	Production Level Tons/Year	Accumulative Production Level Tons/Year
Phase I	106,000 - Converting	106,000 - Converting
Phase II	110,000	110,000
Phase III	124,000 - Converting	230,000 Converting
Phase IV	70,000	180,000
Phase V	110,000	290,000
Phase VI	70,000	360,000

A natural gas package boiler (with No. 2 Fuel Oil or propane as a backup source) associated with each tissue machine would supply steam for the facility.

2.1.2.1 Process Water

During Phase I, mill process water would be supplied by the Colbert County Rural Water System. Beginning with Phase II, and replacing the use of the rural water system, process water would be supplied from the Tennessee River after on-site treatment using chemical addition and clarification. The proposed surface water withdrawal from the Tennessee River would be registered with the Alabama Department of Community and Economic Affairs. Also, appropriate applications have been made with the TVA and the USACE for the water withdrawal and associated intake structure and piping in the Tennessee River. Total projected water usage through all six phases of the proposed mill is noted in the table below.

Phases I - VI
Projected Water Usage

Construction Phase	Total Projected Water Usage (Average) MGD	Accumulative Total Water Usage (Average) MGD
Potable Water – Full Build-out From Colbert County Rural Water System	0.035	0.035
Process Water - Phase I Process Water From Colbert County Rural Water System	0.03	0.030
Phase II from Tennessee River	3.3	3.3
Phase III from Tennessee River	0.03	3.3
Phase IV from Tennessee River	2.2	5.5
Phase V from Tennessee River	3.3	8.8
Phase VI from Tennessee River	2.2	11.0

A 30-inch diameter high density polyethylene (HDPE) pipe from the mill raw water treatment plant would be installed within a 75 to 100 feet wide intake and outfall easement corridor running through TVA property to the raw water intake pump station/wet well (Figures 2.1-1 through 2.1-4). The preliminary design of the pump station, wet well, piping, and intake screens is shown in Figures 2.1-1 through 2.1-6. This 30-inch diameter pipe would be installed by open trench within the corridor to the pump station/wet well. An access road for maintenance purposes to the pump station/wet well would also be constructed within this corridor.

The raw water intake pump station/wet well structure would consist of a 45 x 20 foot rectangular wet well located on TVA property about 50 to 75 linear feet from the normal pool or summer water elevation of 414 feet mean sea level (msl) edge of the Tennessee River. The structure would be located on the bluff of the river bank above elevation 422 feet msl. The top elevation of the wet well structure would be 428. Construction of the wet well would include the placement of sheet piling and excavation to an elevation of approximately 387 feet msl.

Therefore, the depth of the wet well would be approximately 41 feet. The entire structure would be constructed of concrete and would have an open, grated top. There would be no roof over the structure so pump and motors would be exposed to environmental conditions. A security fence around the structure would be provided along with outside lighting for maintenance purposes.

Initially, two 150-horsepower (hp) pumps, each capable of pumping approximately 2,300 gallons per minute (GPM) or 3.3 MGD, would be installed at this raw water pump station/wet well. The operation of the two pumps would alternate while the second pump would serve as a standby or spare. The pump station/wet well would be designed to accommodate two additional pumps to serve future phases of Southeast Tissue, and two additional pumps that could potentially serve future industrial water users in the Barton Riverfront Industrial Park. This EA only addresses the surface water withdrawal for the proposed Southeast Tissue facility because these possible future uses are merely speculative.

Consumptive use of water through evaporative losses, water in final products, and water in waste products is projected to be less than 5% of that water withdrawn from the Tennessee River. Based on proposed surface water withdrawal rates of 3.3 MGD for Phases I – III and 11 MGD for full build-out, consumptive use of water is projected to be less than 0.165 MGD and 0.550 MGD, respectively.

Potable Water

Potable water for the full build-out of the mill (0.035 MGD) and the water for the initial converting operation (Phase I) (0.030 MGD) would be provided by the local public water system (Colbert County Rural Water System) that serves the proposed mill site.

2.1.2.2 Sanitary Wastewater

Sanitary wastewater generated by the mill would be directed to the Town of Cherokee POTW through a pump station/force main and/or gravity piping. Other entities would be responsible for obtaining the necessary approvals for the installation of the pump station/force main and/or gravity sewer lines to transport this wastewater from the mill buildings to the POTW. The line has not yet been planned, but it is likely that they will be routed through the Barton Riverport Industrial Park, and thus will already have been reviewed in the earlier TVA EA's and along existing and maintained roadway rights-of-way, which will already have been disturbed and thus not likely to have any environmental resources of concern.

2.1.2.3 Process and Other Wastewater

Wastewater from the initial converting operations (Phase I), with an estimated flow of 0.030 MGD would be directed to the POTW. This converting wastewater would consist of vacuum pump seal water, floor wash down, and non-contact cooling water. No treatment of the converting wastewater would be provided, with the possible exception of a gravity or coalescing plant oil/water separator.

Beginning with Phase II, Southeast Tissue would generate process wastewater, utility wastewater (boiler blow down, cooling tower blow down, and steam condensate), landfill leachate, and a limited quantity of stormwater runoff from certain manufacturing areas of the mill. The process wastewater, utility wastewater, landfill leachate, and stormwater would be combined and treated at an on site facility prior to being discharged through a proposed Outfall 001 to the Tennessee. After construction and start-up of the on-site wastewater treatment plant, the wastewater from Phase I converting operations, would also be directed to this on-site treatment plant.

The wastewater treatment facility as presently proposed would consist of influent flow monitoring; influent chemical metering for nutrient and defoamer addition; aerated stabilization basins; a settling basin; effluent flow monitoring and sampling; and outfall piping to the

Tennessee River. A subsurface discharge of treated wastewater to the river is proposed. A proposed general site layout drawing showing the proposed wastewater treatment facilities is presented in Figure 1.1-4. A proposed process flow diagram for the wastewater treatment facility is presented in Figure 2.1-7. Components projected to be installed for wastewater flows from additional phases of the proposed mill are shown in Figure 2.1-7 as dotted lines. It should be noted that these are proposed facilities and changes to the facilities could occur during detail design based on final NPDES Permit effluent limitations issued by ADEM, comments received from review agencies, and other factors.

Details of the wastewater treatment facilities for the proposed mill are described below.

Wastewater Treatment Chemical Addition and Metering –

Ammonia and phosphoric acid are to be provided as a supplemental source of nutrients to enhance the biological treatment process in the aerated stabilization basins. A capability to add these nutrients at a ratio of 100 ammonia: 5 nitrogen: 1 phosphorus for biochemical oxygen demand (BOD) would be provided. At this time, it is anticipated that aqueous ammonia and phosphoric acid would be added to the influent wastewater at the wastewater treatment facility from two separate storage tanks. Two chemical metering pumps would be provided for both aqueous ammonia and phosphoric acid. Remote monitoring of the chemical metering pumps would be provided by the deink plant control system.

A capability for adding a defoamer to the influent wastewater to the aerated stabilization basins would be provided. Remote monitoring of the chemical metering pumps would be provided by the deink plant control system.

Aerated Stabilization Basins –

After influent flow monitoring and chemical addition, the wastewater would flow to two separate aerated stabilization basins operating in series for removal of BOD and other organics in the wastewater. Each of the two aerated stabilization basins would have a volume of approximately 16.5 million gallons to accommodate up to the future Phase IV flow and would have multiple 75- or 100-hp floating surface aerators.

Remote monitoring of the stabilization basins and aerators would be provided by the deink plant control system.

It is anticipated that the basins would be constructed by excavating to a certain depth below existing surface elevation and using the excavated material to construct the dike or berms for the basins. A discharge or outfall structure with an overflow weir would be provided for the second aerated stabilization basin.

Settling Basin –

From the aerated stabilization basins, the wastewater would flow by gravity to one settling basin for removal of biological solids generated in the aerated stabilization basins and other solids prior to a discharge to the Tennessee River. The settling basin would have a volume of approximately 12 million gallons to accommodate up to the future Phase IV flow.

It is anticipated that the basin would be constructed by excavating to a certain depth below existing surface elevation and using the excavated material to construct the dike or berm for the basin. A discharge or outfall structure with an overflow weir would be provided for the settling basin.

Effluent Monitoring and Sampling --

Flow and pH monitoring of the effluent wastewater prior to the discharge to the Tennessee River would be provided with a Parshall flume, a continuous recording flow meter, and pH monitor. A refrigerated automatic sampler capable of providing flow-proportional sampling to determine compliance of the discharge with NPDES Permit effluent limitations would also be provided at this location. Remote flow and pH monitoring would be provided by the deink plant control system.

Outfall Piping --

The treated wastewater would flow by gravity to the river and would be discharged beneath the water surface of the river.

A 36-inch diameter HDPE pipe from the mill wastewater treatment plant would be installed within the previously described 75 feet wide intake and outfall easement corridor running through TVA property to the normal pool or summer water elevation of 414 feet msl edge of the Tennessee River (Figures 2.1-1, 2.1-2, and 2.1-3). This 36-inch diameter pipe would be installed by open trench along the corridor to the edge of the river.

The diffuser would have a total of six diffuser ports, each with a diameter of 8 inches. At a full build-out in Phase VI, the discharge velocity out of each port would be about 10 feet per second. At the lower flow rates during the initial phases of the project, a port restrictor plate would be installed to maintain an adequate velocity for proper mixing. The diffuser ports would be angled at a 45° angle (from parallel to river flow) toward the right bank of the main river channel.

2.1.7 Solid and Hazardous Waste Management Facilities

At this date, Southeast Tissue is still considering both on-site and off-site landfill alternatives for disposal of non-hazardous process solid waste generated by the proposed mill, including raw water treatment plant sludge, sludge generated from deinking process operations and wastewater treatment, pulper rejects, and non-putrescible general mill trash. If the off-site landfill alternative is selected, approval for the disposal of this solid waste would be required from the off-site landfill and ADEM.

To support the potential need for an on-site landfill, a hydrogeological investigation of an approximately 75 to 80 acre area along the eastern edge of the proposed mill site was conducted to evaluate the feasibility of the construction of a landfill for disposal of the solid waste. The proposed location of the landfill is shown on Figures 1.1-2, 1.1-3, and 1.1-4. If an on-site landfill is selected for the disposal of this solid waste, a separate detailed application would be submitted to ADEM. It is Southeast Tissue's intent to obtain preliminary approval for the location of an on-site landfill.

The landfill would be constructed in phases to meet the waste disposal needs of the phased expansion of production.

2.1.8 Storm Water Management Systems

An NPDES Permit application has been submitted for discharges from the proposed mill of storm water associated with "industrial activity" from up to two outfalls (002 and 004) (Figures 1.1-2 through 1.1-4). Outfall 002 would be discharged to Mulberry Creek and then to the Tennessee River while Outfall 004 would be discharged to the Tennessee River. Outfall 004 would be associated with the proposed on-site landfill being considered. A stormwater sedimentation/retention basin is planned along the northern edge of the site near the reservoir to manage stormwater associated with industrial activity in later phases of facility construction and operation. However, no separate stormwater discharge or outfall to the Tennessee River

from this basin is being proposed at this time. If this basin is required, several alternatives for the discharge from this basin will be considered, including directing the stormwater discharge to proposed outfall 002 or outfall 004 or directing the discharge through an existing drainage feature to the Tennessee River. It is anticipated that the discharge from this basin would occur above the 414 foot msl elevation. Various state permits may need to be modified to accommodate the basin in the event that a separate outfall or discharge is required and Southeast Tissue would apply to TVA and the USACE for Section 26a approval and Section 404 and Section 10 permits.

Storm water from areas where there is a potential for contact with equipment, raw material, and products would be directed to the process wastewater treatment facility. This includes storm water from chemical storage tank secondary containment structures. Remaining storm water from the site would be directed to one of the stormwater retention ponds/basins on the site. The remaining storm water from various portions of the site would be directed and conveyed to stormwater collection/drainage ditches. These ditches would drain to stormwater retention ponds/basins. Storm water received by these basins would primarily consist of runoff from building roofs and surrounding paved surfaces, including parking lots.

2.1.10 Rail Access and Road Improvements

A railroad spur line to the site would be constructed off of the main Norfolk Southern rail that runs parallel to U.S. Highway 72. This rail line is shown in Figures 1.1-2 through 1.1-4. Traffic to the mill would use the entrance road SEDA is constructing to serve Barton Riverfront Industrial Park. The entrance road would connect directly with U.S. Highway 72 at a new intersection. This entrance road is shown on Figures 1.1.2 through 1.1.4.

2.1.11 River and Barge Traffic

No delivery of raw materials to, or shipment of final product from, the proposed mill by barge on the Tennessee River is being proposed at this time. However, during construction of those phases which would include new paper machines (Phases II, IV, V, and VI), some components of the paper machines and recycling process could be delivered to the site by barge.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed recycle paper tissue mill would not be built at the Barton Riverfront Industrial Park. Under the No Action Alternative, the existing property may continue to be used for agriculture with future industrial/commercial development based on SEDA development plans (see Section 1.3).

2.3 COMPARISON OF ALTERNATIVES

The No Action Alternative would result in no net effect on environmental impacts because existing conditions would not be expected to change. Adverse socioeconomic conditions in the area because of the high unemployment rates of Colbert and Lauderdale Counties (8.6% in Colbert County and 10.2% in Lauderdale County compared to 5.9% for Alabama and 5.8% for the United States) would not be expected to improve under continued agricultural use of the proposed site. In turn, the per capita income and poverty levels would not be expected to improve.

The Proposed Action Alternative would have minor impacts on surface water quality of Pickwick Reservoir from sediment generated during construction of the intake and outfall, the discharge of treated process water, and stormwater runoff. Plant design and procedures to prevent and control spills of on-site chemicals would make any impacts to surface water likely. Chemicals in the wastewater discharge would have no noticeable effect on quality of sediment in the bed of the reservoir. Piping crossing the floodplain of the reservoir would be buried so that there would be no impact on flooding. A small area of reparian wetlands along the reservoir would be temporarily affected by construction for the pipelines. Groundwater at the site would not be significantly affected because the on-site landfill would meet industrial standards, and leachate would be collected for treatment.

Construction of the facility would have minor temporary impacts on air quality. The facility would be voluntarily limit emissions of production to levels below the threshold for requiring prevention of significant deterioration, so impacts on air quality would be significant. As a recycle mill and not a kraft pulping mill, it would have negligible odor.

Some forest and agricultural fields would be destroyed for construction, but the losses would be insignificant, with little effect on wildlife. Lighting of the operating facility would also be designed and operated to have insignificant impacts on wildlife. Small amounts of reservoir bottom

substrate would be removed and some sediment would be generated by construction of the intake and outfall, and the wastewater discharge would create a plume of warmer nutrient- rich water in the reservoir during periods of zero flow. With design of the intake to limit impingement and entrainment of aquatic organisms, state regulations on the discharge, and regular dissipation of the plume when flow continues, the impacts on aquatic ecology and would be insignificant, and there would be no adverse effect on protected mussels. Rare plants in the area of the intake and discharge pipelines would be protected by avoidance and, if needed, approved transplanting and monitoring plants. Gray bats and bald eagles would be able to continue to use the riparian forest left on site as a buffer between the facility and the reservoir.

Impacts on land use would be negligible because the site has already been intended for industrial use. Impacts on employment and income would be beneficial. Impacts on population would be very slight. Impacts on infrastructure and community services would be within current and planned capacities and availabilities. As a temporary obstruction, the construction of the intake and outfall would require notification to the USACE so they could issue public notices to navigation interests. The construction would have insignificant impacts on recreation because generation of sediment which could affect the nearby swimming area would be minimized through control measures and because the obstruction to recreational boating would be temporary and have lights and signs for warning. The discharge from the mill would not have a significant effect on the swimming area because during normal flow and most periods of zero flow, it would not come near the area, and even during rare long periods of zero flow, it would meet state standards for protection of public health and would be very dilute. Environmental justice would not be a concern because there would be so little impact to any people, and no concentration of minority or low income persons in the local population to be disproportionately adversely affected.

Construction of the facility would temporarily and episodically increase ambient noise levels. Operational noise would generally be inside a building, and the aerators and pumps would produce only low noise levels not audible over background at nearby residences. Truck and rail traffic during operation would be noticeable to some residents near the proposed access road and rail spur but would be insignificant primarily due to concentration of the truck and rail traffic during the day.

The property contains no sites listed on or eligible for listing on the National Register of Historic Places, and impacts to the nearby Gilbert House and cemetery would be avoided through the use of development and construction management plans.

Construction activity and the built facilities would be visible from a number of off-site locations. Landscaping, complementary colors for structures along the shoreline, and limitations on lighting would lessen impacts.

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3.0 AFFECTED ENVIRONMENT

3.1 Surface Water Quality of Pickwick Reservoir

There are no persistent surface water bodies within the boundaries of the proposed site. As shown in Figures 1.1-2 through 1.1-4, the prominent nearby water body of concern is the Tennessee River/Pickwick Reservoir, which borders the site to the north.

3.1.1 Hydrologic Characteristics of Pickwick Reservoir

The proposed facility property is located along the south side of the Tennessee River at about TRM 242. (TRMs are measured from the mouth of the river, where it flows into the Ohio River.) This reach of the river is part of Pickwick Reservoir, which was formed when the gates of Pickwick Dam were closed in 1938. The dam is located at TRM 206.7, 35 miles downstream of the site. The direction of flow in the reach adjacent to the site is toward the northwest. Seven of the Tennessee River dams are upstream of Pickwick Dam and one is downstream. The hydrology of the river at the site is affected by Pickwick Dam and Wilson Dam (gates closed in 1924), which is located about 17 miles upstream of the site at TRM 259.4.

Pickwick Reservoir is 53 miles long, with a shoreline of 496 miles and an area of 43,100 acres. Its drainage area is 32,820 square miles. The normal maximum pool elevation is 414 feet above sea level, and winter drawdown averages six feet (Dycus and Baker, 2001). In the reach adjacent to the site, the reservoir is about 3,500 feet wide. The original river channel is between 1,200 and 1,600 feet wide and is bordered on both sides by shallow overbank areas consisting of flooded former bottom land (TVA, 1992). The depth of the channel in this reach is about 28 feet at normal pool, and the depth of the overbank areas varies from about zero to 10 feet. Depth at the dam is about 84 feet.

The average annual discharge at Pickwick Dam is approximately 56,000 cubic feet per second (cfs), which provides an average time for water to flow completely through the reservoir (hydraulic residence time) of about eight days. In contrast, the average flow in 2000, a drought year, was only 31,893 cfs, resulting in a hydraulic residence time of about 15 days. Other measures of lesser flows possible during very dry times include the lowest daily average flow expected for any seven days during a ten year period (7Q10) of 11,600 cfs, and the lowest daily average flow expected for any one day during a ten year period (1Q10) of 8700 cfs. In addition, in managing the flow of the reservoir system, TVA often stops discharge from both Pickwick and

Wilson Dams at the same time. This results in periods of no flow through Pickwick Reservoir nearly every day of the year. There can even be reverse flow after discharge from Pickwick Dam is stopped and the water in the reservoir "sloshes back" as in a bathtub. During the summer, periods of zero flow are of particular concern for water quality because of high water temperature and low DO. These zero-flow periods are usually over 12 hours and sometimes up to 19 hours. The table below presents the percent of time for consecutive hours of zero flow during the summer months (June, August, September) of 1999, 2000, and 2001, three consecutive dry years particularly likely to be of concern for periods of zero flow.

Hours of zero flow	Percent of Time
19	0.3
18	1.1
17	2.7
16	5.5
15	9.6
14	15.0
13	24.9
12	34.4

Pickwick and other reservoirs can be divided longitudinally into three main segments: (1) the inflow area, which is the upstream end and is generally riverine in character; (2) the transition zone or mid-reservoir area, where water velocity decreases due to increased cross-sectional area, suspended materials begin to settle, and algal productivity increases due to increased water clarity; and (3) the forebay area, the lake area near the dam (Dycus and Baker, 2001). The reach of Pickwick Reservoir adjacent to the site is in the transition zone.

3.1.2 Existing Withdrawals and Discharges

The Tennessee River is the primary water supply in the area. According to information provided by ADEM, there are two major industrial users of river water in the vicinity of the site. TVA's Colbert Fossil Plant withdraws approximately 1331 MGD for cooling water at TRM 245, three miles upstream of the site, and Cherokee (formerly La Rouche) Industries, a fertilizer manufacturer, withdraws 40.1 MGD at TRM 238.8, three miles downstream. According to ADECA, around TRM 250 the city of Sheffield withdraws about 2.5 MGD, the city of Florence withdraws about 3.0 MGD, and the city of Tuscumbia withdraws about 1.6 MGD.

Major discharges into the river include Colbert steam plant, 1,331 MGD at TRM 244.1. and Cherokee Industries, 41.5 MGD at TRM 238.8. Upstream of the site between TRM 252.7 and 254.5, the Florence, Sheffield, and Tuscumbia wastewater treatment plants discharge a total of about 40.5 MGD. Downstream of the site at TRM 238.3, the Cherokee wastewater treatment plant discharges about 0.04 MGD.

3.1.3 Water Use Classifications and Quality Criteria

The state has established seven use classifications for its surface waters based on water quality: Outstanding Alabama Water, Public Water Supply, Swimming and Other Whole Body Water-Contact Sports, Shellfish Harvesting, Fish and Wildlife, Limited Warmwater Fishery, and Agricultural and Industrial Water Supply. With the exception of those stream segments in the Public Water Supply classification, every segment, in addition to being considered acceptable for its designated use, is also considered acceptable for any other use with a less stringent associated criterion. The segment of the Tennessee River/Pickwick Reservoir adjacent to the site has been classified for Public Water Supply, Swimming and Other Whole Body Water-Contact Sports, and Fish and Wildlife. This classification applies to the segment extending from the Alabama-Tennessee state line to the lower end of Seven Mile Island (ADEM, September 2000), approximately four miles upstream from the site. ADEM also classifies this section of the Tennessee River as a Tier II waterbody, defined in rule 335-6-10-.04(3) as “waters where the quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.” Tier II waterbodies are subject to special protection and measures to prevent degradation of their quality.

3.1.4 Water Quality Monitoring Activities

Since 1990, TVA has conducted Vital Signs surveys of its reservoirs, including Pickwick Reservoir, for systematically monitoring the ecological condition of its reservoirs. These surveys, conducted annually until 1996 and every two years since then evaluate five indicators of ecological conditions and determine an overall rating for the ecological health of the reservoir (Dycus and Baker, 2001). The five main indicators evaluated are dissolved oxygen (DO), chlorophyll, fish, benthos (bottom life), and sediment. The physical/chemical water characteristics measured and the biological indicators evaluated provide both direct and indirect evidence of the water quality of Pickwick Reservoir. Sediment analyses are discussed in Section 3.2.

Three sites in the main body of Pickwick Reservoir are included in the monitoring program. The forebay sampling location at TRM 207.3 and the transition zone location at TRM 230.0 are monitored for all five indicators. The inflow area sampling location at TRM 259.9 is monitored only for fish and benthos. A fourth location in the Bear Creek embayment also is monitored for five indicators but is not considered here because it is more reflective of the influence of Bear Creek on conditions in the embayment than of overall conditions in Pickwick Reservoir. The water quality parameters measured at the monitoring locations in the transition zone (TRM 230) and the forebay (TRM 207.3), both of which are downstream of the site, are provided in Table 3.1-1. DO, chlorophyll, and other water quality parameters were sampled monthly during the summer (April–October) of 2000.

In 2000, the overall ecological health rating for Pickwick Reservoir was "fair." The rating was just two points below "good," a result generally similar to past years. Scores were "good" in 1991, 1992, 1994, and 1998, and high "fair" (near the "good" category) in 1993 and 1996. Three of the five indicators (DO, fish, and sediment) rated either "good" or "fair" at all locations. Benthos rated "poor" at only one location, Bear Creek embayment. Chlorophyll rated "poor" at all three locations where it was monitored (transition, Bear Creek, and forebay) due to high concentrations during most of the monitoring period. The primary factors that caused the overall rating of the ecological condition to be "fair" rather than "good" was the consistency of the "poor" chlorophyll ratings and the conditions in the Bear Creek embayment, which generally rates lower than other monitoring locations on the reservoir. Years with low reservoir flows, such as 2000, tend to allow high chlorophyll concentrations to develop as long as ample nutrient levels are present, which is typically the case for most reservoirs on the mainstream of the Tennessee River (Dycus and Baker, 2001).

3.1.4.1 Chemistry and Bacteriology

Chemical quality of the reservoir is good, as indicated by TVA samples of fish in the reservoir of 1998. Channel catfish and largemouth bass fillets were analyzed for pesticides, polychlorinated biphenyls (PCBs), and metals, and all contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories (Dycus and Baker, 2001). There are also no swimming advisories based on chemical content of the water.

Ten sites along the reservoir were sampled ten times each for fecal coliform bacteria in 2000. All of the sites met bacteriological water quality criteria for water contact recreation in the state in which they were sampled (Alabama, Tennessee, and Mississippi).

3.1.4.2 Temperature

The Alabama Water Quality Criteria establish 86 degrees Fahrenheit (F) [30 degrees Celsius (C)] as the maximum temperature not to be exceeded in streams, lakes, and reservoirs in the Tennessee River Basin (ADEM, December 1992). As shown in Table 3.1-1, the temperatures measured by the TVA Vital Signs monitoring of Pickwick Reservoir in summer 2000, ranged from 15.8 to 30.6ºC and averaged 24.7ºC at the transition zone monitoring location 12 miles downstream of the site. The conservative summer temperature measurements resulted in average temperature levels below the state criterion of 30ºC, and the criterion was equaled only by the maximum summer temperature recorded in 2000. Accordingly, the existing temperature levels in Pickwick Reservoir are generally protective of aquatic life.

3.1.4.3 Dissolved Oxygen

One of the most important water quality concerns in a reservoir is the level of DO. DO levels at saturation typically are around 10 milligrams per liter (mg/L). The TVA Vital Signs Program selected a DO concentration of 2 mg/L as a level below which undesirable ecological conditions occur in TVA reservoirs (Dycus and Baker, 2001). The Alabama Water Quality Criteria establish 5 mg/L as the minimum daily DO concentration for protection of a diversified warm water biota, including game fish (ADEM, December 1992).

The TVA Vital Signs monitoring of Pickwick Reservoir measures DO both throughout the water column and near the bottom during the six-month summer period when maximum thermal stratification and lowest levels of DO in the lower depths are expected to occur. As shown in Table 3.1-1, the DO levels measured in Pickwick Reservoir in summer of 2000 ranged from 4.5 to 10.3 mg/L and averaged 7.1 mg/L at the transition zone monitoring location 12 miles downstream of the site. The conservative DO measurements resulted in average DO levels well above the state criterion of 5 mg/L and the TVA level of concern of 2 mg/L. Accordingly, the Vital Signs Program rated DO in Pickwick Reservoir as “good,” and the average DO levels generally are protective of aquatic life in the reservoir.

3.1.4.4 Nutrients

Nitrogen (in the forms of ammonia, nitrate, and nitrite) and phosphorus are important naturally-occurring nutrients that have a major influence on aquatic community structure and function. These nutrients may enter the reservoir through point sources, such as wastewater treatment discharges, and non-point sources, including natural sources in the watershed and anthropogenic sources such as municipal sewage treatment plant effluent, storm sewer discharges, and fertilizer and animal waste in runoff from agricultural operations.

The levels of phosphorus and nitrogen in its various forms that were measured by the TVA Vital Signs monitoring of Pickwick Reservoir in summer 2000, at the transition zone monitoring location (and the forebay station) are shown in Table 3.1-1. There currently are no state water quality criteria for phosphorus and nitrogen in Alabama. The watershed of Pickwick Reservoir provides nutrients sufficient to support a mesotrophic condition in the lake, i.e., a condition in which plant productivity is moderate due to the presence of moderate levels of nutrients. The natural sources of these nutrients are the nutrient-rich, easily erodible soils of the watershed; human activities also are an important source. Due to the ample nutrient levels present, years with low reservoir flows, such as 2000, tend to allow high chlorophyll concentrations to develop in the reservoir. In this regard, Pickwick is typical of most reservoirs on the mainstream of the Tennessee River (Dycus and Baker, 2001).

The TVA Vital Signs monitoring of Pickwick Reservoir includes measurement of chlorophyll-a levels as an indicator of nutrient effects in the reservoir. The measurement of concentrations of chlorophyll-a is a simple and well-accepted method for estimating algal biomass, algal productivity, and the trophic condition of a reservoir or lake. Algae are a critical part of the aquatic food web, but in excess amounts they can cause a variety of water quality problems. The chlorophyll-a levels measured in summer 2000 at the transition zone monitoring location (and the forebay station) are shown in Table 3.1-1. Chlorophyll-a levels in 2000 were high at all three monitoring locations in Pickwick Reservoir, as they typically are in years like 2000 when reservoir flows are low. As a result, chlorophyll levels at each location and the reservoir as a whole were rated “poor.” The region has experienced hot, dry weather in recent years, which has resulted in lower flows and clearer water that have provided ideal growing conditions for algae (Dycus and Baker, 2001).

3.2 River Bottom Sediment Quality

The TVA Vital Signs surveys analyze sediment quality by comparing measured concentrations of chemical analytes (organochlorine pesticides, PCBs, and metals) to sediment quality criteria selected to differentiate between polluted and unpolluted conditions. That is, sediments should not have high concentrations of metals compared to background and should have no or at most very low concentrations of pesticides. The results of this comparison are used to develop a sediment quality rating for each of the three locations sampled: the forebay area at the dam, the Bear Creek embayment 17 miles below the site (at TRM 225), and the transition/mid-reservoir area 12 miles below the proposed project site (at TRM 230). The 2000 evaluation found that the sediments were free of detectable levels of pesticides and PCBs, and that concentrations of metals were within expected background levels. Accordingly, sediment quality at all monitoring locations was rated as "good" (Dycus and Baker, 2001). Sediment quality in earlier years had rated either good or fair due to occasional presence of chlordane, DDT, or elevated concentrations of mercury. Mercury is a long-standing issue on Pickwick Reservoir due to previous industrial discharges.

In 1998, TVA performed an assessment of the potential for toxic contaminants in sediment of Pickwick Reservoir adjacent to the site. Sediment samples were collected from four locations adjacent to the site between the main channel and the left (descending) overbank area. The samples were analyzed for priority pollutant metals, organochlorine pesticides (six isomers of dichlorodiphenyltrichloroethane (DDT)), congener-specific PCBs, and selected polycyclic aromatic hydrocarbons (PAHs). The concentrations of chemical constituents detected in the samples were screened by comparing to a range of sediment quality criteria protective of benthic invertebrates. The screening criteria were obtained from a variety of sources and included both lower/threshold effects levels and upper/probable effects levels for each chemical, if available. Based on the screenings, the possibility of adverse effects from each detected chemical on the benthic invertebrate community at each sample location was estimated.

No DDT or PCBs were found above detection limits at any location in the 1998 study. Three metals exceeded sediment quality reference values: mercury exceeded one or more lower reference values in all four samples; copper exceeded one or more reference values in three of the four samples; and nickel exceeded one reference value in only one sample. Three of the four samples also contained one or more PAH compounds at concentrations that exceeded one

or more screening values. Based on these results, each of these metals or compounds was predicted to have the potential to cause infrequent, if any, adverse effects on benthic invertebrates at the locations where they exceeded reference values (TVA, October 1998b).

3.3 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the project site is shown in Figure 3.1-1. The topography of the project site except for the area of the outfall location consists of a large, relatively flat plateau with elevations ranging from 460 feet above sea level where the property boundary lies closest to the Pickwick River shoreline to 580 feet just upstream from the proposed outfall location, so all of this part of the site would be in a zone above the 100- and 500-year floodplains. The elevation of the 100-year flood is 422.4 feet above mean sea level, and the elevation of the 500 year flood is 423.3 feet above MSL As the figure shows, only small areas immediately adjacent to Pickwick Reservoir and Mulberry Creek would be within the 100-year floodplain, and there is no 500-year floodplain mapped in the vicinity of the site.

3.4 Wetlands

A jurisdictional wetland delineation was performed for the project in accordance with USACE guidelines (USACE, 1987). The wetland field investigation was performed in November 2001 and January 2002 (Earth Tech, February 2002). The scope of the field investigation included:

- All potential wetland areas within the project property boundary,
- a corridor between the northern property boundary and the Tennessee River that would contain the facility water intake pipe and wastewater outfall pipe, and
- the transportation corridors for entrance to the facility (rail line and entrance road).

The USACE has verified the jurisdictional wetland boundaries at the site, and a joint Department of Army and TVA permit has been submitted for impacts to wetlands and Waters of the United States, under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbor Act, and Section 26a of the TVA Act.

The wetland delineation identified three isolated nonjurisdictional wetland areas on the project site, and one area that is a jurisdictional wetland.

The three isolated wetland areas have a combined area of about 0.28 acre. These areas are near the southeast corner of the site, north of the transmission line right-of-way and west of the eastern property boundary. These small wetlands are slightly lower in elevation than the surrounding landscape (cotton field) and are isolated from other wetland areas. The water source for these wetlands appears to be runoff from the cotton fields immediately to the west. One of the wetland areas is characterized by conditions that support dominant understory vegetation consisting of pokeweed (*Phytolacca americana*) and blackberry (*Rubus* spp.). This area also supports a canopy dominated by black willow (*Salix nigra*), persimmon, and cherrybark oak (*Quercus pagoda*). The second wetland area has a canopy stratum dominated by black willow and an understory of blackberry. The third wetland area is located along drainage from the second wetland; this drainage and another entering this area have a canopy of black willow and honey locust with an understory of blackberry, fescue grass, and wild onion. No canopy or subcanopy vegetation was present in the agricultural fields surrounding the wetlands (Earth Tech, February 2002).

The USACE does not regulate impacts to such isolated wetlands under provisions of Section 404 of the Clean Water Act, and neither Section 26a of the TVA Act nor Federal Executive Order 11990, Protection of Wetlands applies because the wetlands are not on TVA property. The state has no specific wetland regulations.

The jurisdictional wetland is in the corridor for the water and discharge lines and is along the shore of Pickwick Reservoir at elevations lower than the average high water level (414 feet). It is at most a few tenths of an acre in size.

Jurisdictional wetlands also are found along the shores of Pickwick Reservoir and Mulberry Creek, both adjacent to the site and extending beyond it. These wetlands are similar in kind and essentially continuous with the wetland area along the pipeline corridor.

The wetland areas on and in the vicinity of the site are shown in Figure 3.1-2.

The wetland delineation identified no wetlands along the railway or access road corridor.

3.5 Ground Water

The entire region surrounding the site is underlain by one prominent aquifer, the Tuscumbia-Fort Payne Aquifer. This aquifer is composed of the Tuscumbia Limestone and the Fort Payne

Chert that have similar hydraulic and lithologic characteristics. The main soils overlying these rock units on the proposed site, according to the General Soil Map for Colbert County, are Decatur-Fullerton-Emory soil types (NRCS, 1994). These soil types are characterized by predominantly gently sloping to very steep soils that are well drained and somewhat excessively drained.

The Tuscumbia-Fort Payne Aquifer is recharged throughout the region by water that infiltrates and percolates through the overlying soil, sinkholes, and subsidence depressions. The USGS topographic quadrangle map of the site shows two depressions on the site which could be sinkholes and thus particular recharge areas.

The base of the aquifer is the contact with the underlying Chattanooga Shale. This aquifer is the most widely used aquifer for public water supply in the region (Bossong and Harris, 1987). On a regional scale, the ground water in the Tuscumbia-Fort Payne Aquifer is partially confined because of the lower hydraulic conductivity of the overlying soil. Ground water occurs in solution openings along fractures and bedding planes. These openings in the aquifer are best developed where the overlying rock and soil are less than 200 feet thick. Ground water discharges at the ground surface from numerous springs throughout Colbert County. The largest spring in Colbert County, and one of the largest in Alabama, is Tuscumbia Spring. The minimum measured discharge of this spring, which flows from openings in the Tuscumbia Limestone, is about 6 MGD. The maximum flow is more than 80 MGD. This spring is located approximately 12 miles east of the site.

In a 1963, U.S. Geological Survey publication data were presented from 26 pumping tests performed on 18 wells that were completed in the Tuscumbia-Fort Payne Aquifer. Those data indicated that the wells could be pumped steadily, with minimum drawdown in many cases, at 4 GPM to 1,600 GPM (Harris, Moore, and West, 1963).

The regional Tuscumbia-Fort Payne Aquifer underneath the site is hydraulically connected to the Tennessee River. The water table tends to reflect major topographic features, and groundwater elevations at the site are generally above the elevation of the river, resulting in a gradient toward the river. Groundwater flow in the Tuscumbia Limestone primarily occurs along bedding-plane fractures and vertical joints. At the site, the ground water generally flows toward the reservoir with components of groundwater flow to the west toward Mulberry Creek and to the east toward the unnamed drainage feature adjacent to the site. Ground water from the site

is not expected to travel across the creek or the drainage feature. Water level measurements taken at the site during the subsurface exploration program conducted for a potential on site landfill measured ground water at depths varying from 30 to 60 feet below ground surface.

The highest seasonal water levels generally occur in March and the lowest in October. These measurements correspond with the seasonal times of highest and lowest precipitation, indicating most of the groundwater recharge occurs during the rainy season (TVA, 1999).

Limited information is available concerning the use of ground water in the area. The Water Supply Branch of ADEM was contacted concerning water supply wells in the vicinity of Barton (J. Power, personal communication, February 2002). There are no public water supply wells within a 2-mile radius of Barton. The records of private water wells are minimal due to the lack of reporting requirements. In a survey performed by the Geological Survey of Alabama (Oglesby and Moore, 1989), a spring used for domestic purposes known as Parker Spring was identified in the Mulberry Lane area west of the site across Mulberry Creek. The probable source of ground water at the spring was listed as the Tuscumbia Limestone Aquifer and flow (measured in the 1950s) ranged from 242 to 628 GPM.

3.6 Air Quality

Primary national ambient air quality standards (NAAQSs) were promulgated to protect the public health; secondary NAAQSs were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. EPA has established NAAQSs for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter with a diameter less than or equal to 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$), lead, and ozone. The primary and secondary ambient air standards are presented in Table 3.1-2. Areas of the country meeting the NAAQS for a given air pollutant are designated as “attainment areas” for that pollutant. Areas of the country in violation of a NAAQS are designated as “nonattainment areas”, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

The State of Alabama has adopted the federal NAAQSs as the State standards. Colbert County, has been designated by the EPA as an “attainment area” for all criteria air pollutants. The site is 37 miles from the nearest federally protected Prevention of Significant Deterioration (PSD) Class I area, Sipsey Wilderness Area, located to the southeast of the site. According to

data recorded at the Florence Gas Department weather station in Florence, Alabama, 14 miles northeast of the site, annual prevailing wind direction is predominantly from the south, and speeds average four to 13 miles per hour.

At present, farm equipment and activities are the only source of air emissions on the site. These emissions are relatively minor and typical of rural, agricultural areas. Dust from plowed fields and odor from farm operations are probably the most noticeable pollutants but are not currently problems in the area. Colbert Steam Plant is the nearest major source of industrial emissions. Vehicular traffic along U.S. Highway 72 is also a minor source of emissions in the area.

3.7 Terrestrial ECOLOGY

The site encompasses three principal habitats: upland mixed forest community, upland pine forest community, and agricultural fields, in addition to the isolated wetlands described in section 3.4 above. The flora, fauna, and other characteristics of these habitats are described below. Figure 3.1-2 shows an aerial view of the site and the locations of the proposed facilities relative to the principal habits. No uncommon plant communities occur on or adjacent to the site and the layout of the proposed facilities.

3.7.1 Upland Mixed Forest

The upland mixed forest community is a component of the pine/mixed hardwood ecological association and is typical of a mesic upland, with soils containing dry to moist clay, silt, and organic material. In the vicinity of the site, this forest community is dominated by a diverse mix of broad-leaved and needle-leaved temperate woody species, which form a thick canopy of overstory vegetation.. This community dominates the north portion of the site property. It also extends north to Pickwick Lake, continues around the western perimeter of the site and west to Mulberry Creek, and covers the area adjoining the eastern property boundary and extending southeast along the river to the vicinity of Cane Creek. Thus, this community occupies an area averaging approximately 600 to 700 feet wide that extends along the Tennessee River from Mulberry Creek to the Cane Creek floodplain east of the site. Limestone boulders and outcroppings are common throughout this forest on and north of the site and the soils of the bluffs along the Tennessee River are drier and have a more basic pH than the remainder of the site.

The upland mixed forest community is absent from the interior of the site and across much of the southern site boundary due to the conversion of these areas to agricultural fields. However, remnant pockets of upland mixed forest remain in and around drainage features that intersect the agricultural fields. Most of this community is mature oak-hickory forest, but there are patches where pines predominate. Characteristic tree species in these forests include white oak (*Quercus alba*), bitternut hickory (*Carya cordiformis*), swamp chestnut oak (*Quercus michauxii*), shagbark hickory (*Carya ovata*), post oak (*Quercus stellata*), southern red oak (*Quercus falcata*), water oak (*Quercus nigra*), hackberry (*Celtis occidentalis*), dogwood (*Cornus florida*), redbud (*Cercis canadensis*), sassafras (*Sassafras albidum*), Osage orange (*Maclura pomifera*), sycamore (*Platanus occidentalis*), beech (*Fagus grandifolia*), sugar maple (*Acer saccharinum*), tulip tree (*Liriodendron tulipifera*), eastern red cedar (*Juniperus virginiana*), loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), persimmon (*Diospyros virginiana*), and sweetgum (*Liquidambar styraciflua*).

This forest supports a rich diversity of understory plants in limited areas. (This statement seems to directly contradict the statement highlighted above that says this forest has a minimum understory component.) Earth Tech LEO 5-20 Herbaceous vegetation in the understory includes broomsedge (*Andropogon virginicus*), long cane (*Arundinaria gigantea*), beautyberry (*Callicarpa americana*), Christmas fern (*Polystichum acrostichoides*), spotted wintergreen (*Chimaphila maculata*), and white snake root (*Eupatorium rugosum*). Shrub vegetation consists of flowering dogwood (*Cornus florida*), greenbrier (*Smilax* spp.), Japanese honeysuckle (*Lonicera japonica*), muscadine (*Vitus rotundifolia*), mulberry (*Morus rubra*), Chinese privet (*Ligustrum sinense*), and winged sumac (*Rhus copallina*).

The upland mixed forest provides habitat for a rich diversity of wildlife species. Avian species observed in this community include the red-tailed hawk (*Buteo jamaicensis*), American robin (*Turdus migratorius*), common crow (*Corvus brachyrhynchos*), red-headed woodpecker (*Melanerpes erythrocephalus*), Carolina chickadee (*Parus carolinensis*), and barred owl (*Strix varia*). Other avian species likely to occur in this forest include the whip-poor-will (*Caprimulgus vociferus*), Cooper's hawk (*Accipiter cooperii*), broad-winged hawk (*Buteo platypterus*), red-eyed vireo (*Vireo olivaceus*), scarlet tanager (*Piranga olivacea*), tufted titmouse (*Parus bicolor*), downy woodpecker (*Picoides pubescens*), pileated woodpecker (*Dryocopus pileatus*), blue jay (*Cyanocitta cristata*), and wild turkey (*Meleagris gallopavo*). The belted kingfisher (*Megaceryle alcyon*), green heron (*Butorides striatus*), great blue heron (*Ardea herodias*) and gull species

forage along the forested riparian zone and shoreline of Pickwick Reservoir and Mulberry Creek.

Mammals that typically utilize this forest habitat include the white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), southern flying squirrel (*Glaucomys volans*), white-footed mouse (*Peromyscus leucopus*), woodland vole (*Microtus pennsylvanicus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), armadillo (*Dasypus novemcinctus*), and cottontail rabbit (*Sylvilagus floridanus*). Reptiles commonly associated with this habitat include the timber rattlesnake (*Crotalus horridus*), three-toed box turtle (*Terrapene carolina triunguis*), black rat snake (*Elaphe obsoleta obsoleta*), and five-lined skink (*Eumeces fasciatus*). Amphibians likely to occur in this habitat include the marbled salamander (*Ambystoma opacum*), slimy salamander (*Plethodon glutinosus*), and spotted salamander (*Ambystoma maculatum*).

3.7.2 Upland Pine Forest

An upland pine forest community covers much of the southwest quadrant of the site and also occurs in a zone along the southern margin of the upland mixed forest community adjacent to the agricultural fields. In addition, this forest occurs along ravines and in certain areas where pines have regenerated in former cotton fields. The principal tree species in this community are loblolly pine (*Pinus taeda*) and Virginia pine (*Pinus virginiana*). Based on review of historic aerial photographs, it appears that the pine trees of this forest were planted around 1990 following timber harvesting in these areas. Ecotones between the forest and the fields support shrubby vegetation that provides food and cover for wildlife.

Birds that commonly utilize upland pine forest as habitat in this region include the mourning dove (*Zenaida macroura*), northern cardinal (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), and brown thrasher (*Toxostoma rufum*). Common mammal inhabitants of this community include the hispid cotton rat (*Sigmodon hispidus*) and least shrew (*Cryptotis parva*). Reptile and amphibian and species that may utilize this habitat include the northern black racer (*Coluber constrictor constrictor*), fence lizard (*Sceloporus undulatus*), and American toad (*Bufo americanus*).

3.7.3 Agricultural Fields

The habitat on approximately two-thirds of the site, principally the southern and eastern portions, consists of agricultural fields currently devoted to farming. The principal crop grown on the site is cotton. At the time of the site reconnaissance in November 2001, the cotton fields had no ground cover, and areas of moderate to severe soil erosion were observed, particularly on the eastern side of the site. Corn is also grown on some fields, principally on land south of the transmission line right-of-way (i.e., south of the site). The roadway and railway corridors extend to the facility property from the south across agricultural fields that are fallow or are used for growing cotton.

Agricultural fields in cultivation or without ground cover provide poor habitat for wildlife. Cultivated fields are separated by grassy strips, and fallow fields support weedy vegetation typical of farmland. The ground cover of fallow areas includes wild onion (*Allium canadense*), foxtail grass (*Setaria italica*), and unidentified pasture grasses. Some saplings of staghorn(?) sumac (Rhus typhina) or winged sumac sumac (*Rhus copallinum*) are present. Areas around the margins of the fields are in various stages of succession from meadow to mixed forest. The meadows support numerous saplings and provide nesting and foraging habitat for songbirds. Fencerows and field edges contain species such as honey locust (*Gleditsia triacanthos*), southern red oak, water oak, hackberry, eastern red cedar, persimmon, goldenrod (*Solidago* spp.), and partridge pea (*Cassia fasciculata*). There are small inclusions of open, grassy field mainly located adjacent to the gas line right-of-way near Mulberry Creek. The dominant vegetation in these areas is broomsedge.

3.8 Aquatic Ecology

There are no water bodies that provide persistent habitats for aquatic organisms within the boundaries of the proposed site. The majority of the drainage features on the site carry runoff toward the Tennessee River/Pickwick Reservoir to the north and Mulberry Creek to the west. The roadway corridor crosses a perennial stream, Whitley Branch, which is located almost two miles south of the property and drains eastward to Cane Creek. Figure 1.1-3 provides an aerial view of the site overlaid with the outlines of the property boundaries and the proposed mill facilities. This figure shows the relationships between the planned locations of facilities and the adjacent aquatic habitats of Pickwick Reservoir and its tributaries, Mulberry Creek immediately downstream of the site and Cane Creek upstream of the site. The figure also shows the original

channel of the Tennessee River within the reservoir and the extent of the submerged overbank areas in the segment adjacent to the site

The aquatic organisms potentially affected by the proposed action utilize as habitat the segment of Pickwick Reservoir adjacent to and downstream of the site. The portion of Mulberry Creek that receives stormwater runoff from the site of the proposed facility is impounded by Pickwick Reservoir. Cane Creek does not receive runoff from the facility site, and Whitley Branch is not expected to receive runoff or otherwise be affected by the facility following road construction.

Aquatic invertebrates and fish are the principal groups of potentially affected organisms in the river/reservoir habitat adjacent to the site. Other potentially affected wildlife includes birds, mammals, reptiles, and amphibians. .

3.8.1 Invertebrates

Aquatic invertebrate species inhabiting the Pickwick Reservoir of the Tennessee River include organisms that live in the water column as well as organisms that live in association with the bottom of the river/reservoir. Invertebrates that live in the water column include plankton and larger, swimming invertebrates, such as insects. Bottom-dwelling (benthic) invertebrates that live on and within the sediments include roundworms, insects, crustaceans, and mollusks.

TVA monitors and evaluates the ecological community of Pickwick Reservoir downstream of the Colbert Fossil Plant. The monitoring includes sampling of the benthic macroinvertebrate community. The most recent sampling was performed in autumn of 2000. The downstream locations for this monitoring are adjacent to the site of the proposed facility. Benthic macroinvertebrate sampling consisted of ten grab samples collected at equally spaced points along a transect at TRM 244, immediately downstream of the mouth of Cane Creek and upstream of the site. Seven benthic community metrics were measured or calculated, and the scoring based on these seven metrics rated the benthic macroinvertebrate community as “good” overall in this area of the reservoir (reference).

In addition, the TVA Vital Signs survey of Pickwick Reservoir provides an indication of the condition of the benthic community in the reservoir as a whole. Samples are collected at three transect locations: in the forebay area at the dam, in the mid-reservoir transition area 12 miles below the proposed project site (at TRM 230), and in the inflow area 11 miles upstream of the site. Based on the interpretation of multiple benthic community metrics, in 2000, the condition of

the community was rated “fair” at the inflow and transition monitoring locations and “good” at the forebay location (Dycus and Baker, 2001).

Freshwater mussels (bivalve mollusks) are the largest and most notable members of the invertebrate community of the Tennessee River. A number of surveys of freshwater mussel resources have been conducted in the Tennessee River downstream from Wilson Dam during the last 25 years. Two TVA mussel surveys of the Pickwick Reservoir (TVA, 1992 and TVA, 1998) provided information that is especially pertinent to the site. In 1992, TVA staff conducted a dive survey of freshwater mussels in the river/reservoir between the mouths of Cane Creek and Mulberry Creek (TRM 241.6 - 244.1), the segment of river adjacent to the site. Fifteen transects were surveyed in the river, including six transects scattered along the left (descending) bank and overbank between the mouths of Mulberry and Cane Creeks (TRM 241.6 - 244.1), seven transects located along the left margin of the original river channel in this segment of the river, and two transects located on the right margin of the channel.

This survey yielded 34 live mussels representing nine native mussel species (none were federally or state-listed as endangered species). Average mussel density was low, estimated to be approximately 0.07 live animals per square meter. The survey results indicated that very few mussels exist in this area of the reservoir, and the species that were present are species that are widespread throughout much of the Tennessee and Ohio River systems. The mussel species and numbers of specimens collected in this survey are shown in the table below.

Species	Common Name	Number collected
Amblema plicata	Threeridge	3
Anodonta grandis	Giant floater	5
Arcidens confragosus	Rock pocketbook	1
Elliptio crassidens	Elephantear	2
Fusconaia ebena	Ebonyshell	1
Megalonaias nervosa	Washboard	6
Pleurobema cordatum	Ohio pigtoe	1
Potamilus alatus	Pink heelsplitter	10
Quadrula quadrula	Mapleleaf	5

In 1998, TVA staff conducted a dive survey at a proposed barge terminal along the left (descending) bank of the river just upstream from the Colbert Fossil Plant (at TRM 246.9, five miles upstream of the site). During 54 minutes of dive time, this survey yielded 85 live mussels representing 12 widespread and relatively common native mussel species. Habitats at both of the areas surveyed consisted of fine silt over clay in the shallows and fine silt over a variety of substrates in deeper water. In particular, the 1992 study found that the river bottom in the overbank area adjacent to the site consisted mainly of firm silt overlaying firm clay. These are marginal habitat for most native mussels, which generally are found in stable gravel and cobble substrates (Jenkinson, 1998).

3.8.2 Fish

Among the vertebrate groups inhabiting Pickwick Reservoir in the site vicinity, the fish community is dominant in terms of numbers, diversity, and biomass. Fish communities in reservoirs typically vary within the reservoir, with a more riverine community typically occurring at the inflow end of the reservoir and a more lacustrine community typically occurring in the pool near the dam. The segment of the reservoir adjacent to the site is in the mid-reservoir, transition zone, and the fish community in this area is likely to have characteristics intermediate between these two community types.

TVA monitors and evaluates the ecological community of Pickwick Reservoir downstream of the Colbert Fossil Plant.. The monitoring includes sampling of the fish community. The most recent sampling was performed in autumn of 2000. The downstream locations for this monitoring were centered upstream and downstream of TRM 242, adjacent to the proposed location of the intake/outfall for the proposed facility. Fish sampling consisted of 15 300-meter electrofishing runs (approximately 10 minutes duration) and ten experimental gill net sets (five 6.1 meter panels with mesh sizes of 2.5, 5.1, 7.6, 10.2, and 12.7 cm per site).

Fish data were scored and assigned a rating (poor, fair, good, or excellent) using TVA's Reservoir Fish Assessment Index (RFAI). The RFAI integrates the results of metrics measured or calculated for species richness and composition, trophic composition, reproductive composition, and fish abundance and health. The rating was based on "expected" fish community characteristics in the absence of human-induced impacts other than impoundment. The overall RFAI score for the fish community in this area of the reservoir was "good" and exceeded 70% of the highest attainable score, indicating a balanced fish community.

In addition, the 2000 TVA Vital Signs survey of Pickwick Reservoir indicated that the overall ecological health of the reservoir was "fair," with a score just below the cutoff for "good." The 1998 survey rating was "good." The fish community assessment consisted of shoreline electrofishing and gill netting samples collected at three locations in the main body of the reservoir: in the forebay area at the dam, in the transition area 12 miles below the proposed project site (at TRM 230), and in the inflow area 11 miles above the site. Based on the interpretation of multiple metrics by TVA scientists, the condition of the fish community was rated "good" at both the transition and inflow locations (Dycus and Baker, 2001).

Over 30 fish species have been collected in Pickwick Reservoir in a variety of studies. A representative list of species that have been identified in the lake is provided in Table 3.2-1. Based on fish sampling studies, the most common fish are herring and shad, minnows, sunfishes, and basses. Important gamefish include the largemouth bass, smallmouth bass, spotted bass, striped bass, white bass, bluegill, channel catfish, crappie, and sauger.

Pickwick Reservoir is nationally recognized as a smallmouth bass fishery, particularly the inflow area below Wilson Dam. The TVA and state fisheries agencies have created a Sport Fishing Index that reflects fishing quality for a range of species in the TVA reservoirs. The index scores for each species are based both on population measures (the size and health of the individual fish and the number of fish present) and on fishing pressure and success information (the number of anglers fishing for a particular type of fish and the number of that type that they actually catch). The Sport Fishing Index score for each fish ranges from a high of 60 (excellent) to a low of 20 (very poor). The 2000 scores for specific fish species in Pickwick Reservoir are presented below. For each species, the score for Pickwick is followed for comparison by the average valleywide score for the TVA reservoirs: largemouth bass (27/33), smallmouth bass (37/30), spotted bass (24/30), bluegill (33/30), channel catfish (20/23), crappie (21/31), walleye/sauger (40/28), striped bass (20/26), and white bass (40/26). Based on these scores, overall Sport Fishing Index ratings for Pickwick Reservoir in 2000 were as follows: "above average" for bluegill and walleye/sauger, "average" for the black bass category (largemouth, smallmouth, and spotted basses), and "below average" for channel catfish and crappie (TVA, February 2002).

3.8.3 Other Wildlife

Birds that utilize the aquatic habitat of Pickwick Reservoir in the vicinity of the site include waterfowl, gulls, wading birds, diving birds, and raptors. Waterfowl likely to forage in this area throughout the year include the Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), and wood duck (*Aix sponsa*); however, the principal use of the area by waterfowl is for wintering habitat. Species likely to winter in the area include the ring-necked duck (*Aythya collaris*), bufflehead (*Bucephala albeola*), black duck (*Anas rubripes*), gadwall (*Anas strepera*), pintail (*Anas acuta*), and hooded merganser (*Lophodytes cucullatus*). Seven Mile Island Wildlife Management Area, located about four miles upstream from the site, is managed by the Game and Fish Division of the Alabama Department of Conservation and Natural Resources (ADCNR) primarily for waterfowl hunting (TVA, 1999). Wading birds expected to forage for fish and other aquatic prey along the shoreline include the great blue heron (*Ardea herodias*) and green heron (*Butorides striatus*). Diving birds that potentially utilize this habitat include the pied-billed grebe (*Podilymbus podiceps*), a resident throughout the year, and the common loon (*Gavia immer*), a winter migrant. Raptors that may prey on fish from the reservoir and may roost in the riparian forest along the shoreline include the osprey (*Pandion haliaetus*) and bald eagle (*Haliaeetus leucocephalus*).

Aquatic mammals that are likely to utilize Pickwick Reservoir as habitat include the beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and river otter (*Lutra canadensis*).

Amphibian species likely to be present include the red-spotted newt (*Notophthalmus viridescens viridescens*), mudpuppy (*Necturus maculosus*), bullfrog (*Rana catesbeiana*), and green frog (*Rana clamitans*). Reptiles likely to be present include the snapping turtle (*Chelydra serpentina*), mud turtle (*Kinosternon subrubrum subrubrum*), stinkpot (*Sternotherus odoratus*), river cooter (*Chrysemys concinna*), midland water snake (*Nerodia sipedon pleuralis*), western cottonmouth (*Agkistrodon piscivorus leucostoma*), and eastern ribbon snake (*Thamnophis sauritus sauritus*).

3.9 Endangered, Threatened, and Rare Species

3.9.1 Recorded ETR Species

The area contains a number of species federally-listed as endangered or threatened, proposed for federal-listing as endangered or threatened, state-listed as protected, or ranked by The

Nature Conservancy as S1 (critically imperiled in Alabama because of extreme rarity) or S2 (imperiled in the state because of rarity). These endangered, threatened, and rare (ETR) species are listed in Table 3.2-2, summarized from data reported by the Alabama Natural Heritage Program (ALNHP) database (January, 2002) for the vicinity of the site. The latitude and longitude of each occurrence was plotted on a topographic map of the site vicinity (Figure 3.2-1). The symbols representing the approximate locations of ETR species on the map are numbered, and the numbers are included in Table 3.2-2 as a key to the locations where each species has been observed. As the figure shows, no occurrences of ETR species from the site itself have been reported to the Alabama Natural Heritage Program.

Of the species identified in the table, five are federally-listed as endangered, and these species also are state protected: the gray bat, pink mucket mussel, rough pigtoe mussel, orangefooted pimpleback, and white wartyback mussel. The bald eagle is federally-listed as threatened in parts of its range, including Alabama (it has been proposed for delisting), and it is state protected. Species that are listed as state protected but that are not federally-listed are the spring pygmy sunfish, Tuscumbia darter, pyramid pigtoe mussel, sheepnose mussel, Tennessee cave salamander, and southern cavefish. Species that are not legally protected, but are ranked S1 (critically imperiled in Alabama) or S2 (imperiled in Alabama) by TNC, are the following: Georgia rock-cress (also a federal candidate species); Dutchman's breeches; the long-solid, Ohio pigtoe, and purple lilliput mussels; the Alabama cave crayfish; and the phantom cave crayfish (ALNHP, January 2002).

3.9.2 Site Surveys Identifying ETR Plants

Several surveys of the site property and adjacent TVA property for ETR plants and animals (in November 2001 and January 2002, by Earth Tech), as well as earlier reconnaissance activities in the area (TVA, 1997; 1999) did not record the presence of any ETR species on the site. A focused survey by TVA of the proposed pipeline corridor from the facility to the reservoir shoreline on April 6, 2002 (J.L. Collins, personal communication) did identify a population of over 100 individual plants of Dutchman's breeches, including juveniles. Dutchman's breeches is ranked S2 due to its rarity in Alabama. This survey also identified a population of less than 100 individuals of Enemion (=Isopyrum) biternatum in that area. This species is not listed in Table 3.2-2 or shown in Figure 3.2-1 because it is not otherwise known to occur in the vicinity of the site. It is also ranked S2 by TNC. The locations of the populations found in the survey are shown in Figure 3.2-2 [the figure in the email sent to Becky on 06-03-2002].

3.9.3 Likelihood of Terrestrial ETR Animals On Site

Although no ETR animal species have been observed at the site, potential habitats for several are present in the vicinity. The likelihood that ETR species may utilize the existing environment at or adjacent to the site is evaluated below based on the available evidence regarding each species and its preferred habitat.

Gray bats – The gray bat (*Myotis grisescens*), roosts and hibernates in caves, and it forages over open water along rivers and lakes. There are no caves on the site to provide roosting habitat for the gray bat. However, four caves in the vicinity are used by gray bats for resting or hibernation (see Table 3.2-2 and Figure 3.2-1). Key Cave, located about 7 miles upstream from the site in the Key Cave NWR, provides critical habitat for gray bat maternity colonies during the summer. Two other caves are located about 5.5 miles upstream, one in the Seven Mile Island Wildlife Management Area and the other slightly downstream near the south bank of the reservoir. The fourth cave is located about 5.6 miles downstream of the site near the south bank of the reservoir and the mouth of Colbert Creek (ALNHP, January 2002). TVA monitoring confirms that the bats move between the caves upstream and downstream of the site and forage over Pickwick Reservoir adjacent to the site (Henry, personal communication).

Bald Eagles -- The bald eagle (*Haliaeetus leucocephalus)* is federally listed as threatened (proposed for delisting) and is state-protected in Alabama. The preferred habitat of the bald eagle in inland areas of the southeastern United States is wooded shorelines of large lakes and rivers. Fish and waterfowl are the principal prey of the bald eagle, and large trees in the riparian zone are used for perching and nesting. The most recent recorded nesting of the bald eagle in the site vicinity was in 1990 at a location about 3.5 miles north of the site. Although incubation occurred, the 1990 nest was unsuccessful in hatching eaglets, and a 1989 nest in the same area also was unsuccessful (ALNHP, January 2002). The reach of Pickwick Reservoir and riparian forest adjacent to the site provide habitat that potentially could be used by the bald eagle for foraging and roosting.

3.9.4 Aquatic ETR Species in Pickwick Reservoir

Eleven aquatic ETR species have been reported in the vicinity of the site. Two of these ETR species are fish and nine are mussels (see Table 3.2-2 and Figure 3.2-1).

Fish -- The two fish species known from the area, the spring pygmy sunfish and the Tuscumbia darter are state protected species that were last observed in this vicinity in 1937 prior to the closure of Pickwick Dam (ALNHP, January 2002). The preferred habitat of both of these fish is springs with heavy growths of aquatic vegetation. This habitat does not occur on or adjacent to the project site, and these fish are not likely to occur in areas which could be affected by the proposed mill.

Mussels -- As indicated in Section 3.8.1, a number of surveys of freshwater mussel resources have been conducted in the upstream part of Pickwick Reservoir during the last 25 years. These post-impoundment surveys and other studies in the area suggest that five federal endangered mussel species occur in the riverine part of the Tennessee River downstream from Wilson Dam. Farther downstream in the reservoir, however, mussel diversity declines and the endangered species appear to be either absent or much less abundant. None of these endangered mussel species have been found outside of the original river channel (TVA, March 1999).

The nine ETR mussel species listed in Table 3.2.2 all have been observed around and upstream from Seven Mile Island, about 5.5 miles upstream of the site. In addition, three of these species were encountered approximately 1.2 miles downstream of the project site along the north shore of the reservoir (see Table 3.2-2 and Figure 3.1-2) (ALNHP, January 2002). None of these protected mussel species were encountered during the recent surveys adjacent to the project site or not far upstream from the mouth of Cane Creek. .

The U.S. FWS has begun a project to establish nonessential experimental populations (NEPs) of 16 federally listed endangered mussels and one endangered freshwater snail in the first ten miles of Pickwick Reservoir downstream from Wilson Dam (TRM 258 to TRM 248), about five miles above the site. None of these mollusk species are known to currently exist in this river reach, and these potential future populations are not expected to extend downstream into the river reach adjacent to the project site (Federal Register, June, 2001).

3.9.5 Cave-Obligate Species

The Tennessee cave salamander, southern cavefish, Alabama cave crayfish; and the phantom cave crayfish are all found only in caves. They have been recorded in three caves in the vicinity, two that are upstream of the site near Seven Mile Island located about 6 miles upstream

from the site on the opposite (north) side of the river, and one that is inland about 5 miles northwest of the site (ALNHP, January 2002). None of these caves are located where they would be likely to be influenced by activities on the site, and there are no cave habitats on the site.

3.10 Socioeconomic Conditions

3.10.1 Land Use

The site is located on the northern edge of Colbert County, approximately two miles north of the community of Barton and four miles east of the community of Cherokee. Across the Tennessee River to the north is Lauderdale County. The closest major population center is the "Quad Cities" area (Florence, Muscle Shoals, Sheffield, and Tuscumbia) located upstream on the Tennessee River approximately 12 miles to the east of the site. The site is part of the Barton Riverport Industrial Park currently, but is now and has been historically used for agriculture. Until the early 1990's it was the Gilbert Experimental Farm of Auburn University. The principal crop grown on the site is cotton. Cropland comprises approximately two-thirds of the site, with the remainder occupied by woodlands. Surrounding properties are primarily farmland and woodlands, with scattered residences. To the west and north, between the site and Mulberry Creek and the Tennessee River, is a narrow strip of TVA property and privately owned property, there is also TVA property to the east. The land to the south is part of the Barton Riverfront Industrial Park. Across Mulberry Creek to the west is a residential area along Mulberry Road, oriented toward the creek and the river. To the south and east, beyond the industrial park, the land use is low density rural-residential with agricultural activity. Industrial land uses in the area include the Colbert Fossil Plant approximately 2 miles to the east along the Tennessee River and Muscle Shoals Minerals, Inc., a silica manufacturing operation, located approximately 1.2 miles south of the site.

The area surrounding the site is typical of rural lands in northern Colbert County, consisting of gently rolling hills, mixed hardwood forests, and agricultural areas. Land use in Colbert County is approximately 61% woodland, 18% cultivated crops, 13% pasture, and 8% urban or built-up land (NRCS, 1994). Land use in the entire Pickwick Reservoir watershed is similar: 53% forest, 20% pasture, 11% cropland, 2% urban, and 14% other (TVA, March 1999).

The site is located within the jurisdiction of Colbert County, which has no zoning ordinance or land use planning. However, industrial is the intended land use for the site, given that it lies within the Barton Riverfront Industrial Park being developed by SEDA. Even before the designation of the site as an industrial park, it had been considered for industrial use by a previous company intending to locate a similar recycle paper mill.

3.10.2 Employment

The total civilian labor force and employment in the Florence MSA decreased between 1998 and 2000. The labor force fell from 68,604 to 66,911 and employment fell from 63,779 to 63,047 for employment. During the same period, unemployment levels decreased from 7.0% to 5.8%. However, unemployment in the Florence MSA has consistently been above the state average, which ranged from 4.2% in 1998 to 4.6% in 2000 (U.S. Bureau of Labor Statistics, January 2002). As of December 2001, the total labor force in the Florence MSA had increased to 68,110, while employment continued its decrease to 61,580 and unemployment rose to 9.6% (compared to 5.8% for the State of Alabama). The leading employment sectors are wholesale and retail trade (27% of employment), government (23%), manufacturing (19%), and services (18%). Three sectors, construction/mining, transportation/public utilities, and finance/insurance/real estate, employ the remaining 13% of workers.

An industry of regional importance in the State of Alabama is the commercial harvesting of mussels from the Tennessee River. Approximately 90% of the commercial mussel harvesting conducted in Alabama takes place in the Pickwick Reservoir, specifically within the reach of the reservoir from Seven Mile Island 10 miles upstream of the site to Bear Creek approximately 16 miles downstream (TRM 252 to 226) (J. Garner, personal communication, February 2002). Mussel shell is exported to Asia for use in the production of cultured pearls. The Tennessee River is currently the most important source of commercial mussels in the world (ADCNR, 2002). The yearly value of exported shell has been as high as $20 million. However, the recent loss of pearl oysters in Japan due to environmental conditions has caused a decline in demand for mussel shell. In 2001, approximately 250 tons of mussels were harvested from Pickwick Reservoir and sold for approximately $270,000 (J. Garner, personal communication, February 2002).

3.10.3 Income

According to latest available data from the U.S. Census Bureau (January 2002), the 1997 per capita personal incomes in Colbert and Lauderdale Counties were $20,155 and $19,576, respectively. These incomes were slightly below the Alabama average of $20,672. In 1997, the number of inhabitants living below the poverty line was 13.5% of the total population in Colbert County and 13.3% in Lauderdale County. These poverty levels were less than the 1997 state poverty rate of 16.2%.

3.10.4 Population

The proposed tissue mill site is located in Colbert County, Alabama, across the Tennessee River from Lauderdale County, Alabama. These two counties constitute the Florence Metropolitan Statistical Area (MSA). Over the past two decades, the total population of the MSA declined and then increased. Between 1980 and 1990, the Colbert County population declined by 5.2% and Lauderdale County declined by 1.1%, and the Florence MSA declined by 2.8% (from 135,065 to 131,327 persons). This compares to a growth rate of 3.8% for the State of Alabama during the same period. Between 1990 and 2000, the populations of both counties rebounded, increasing by 6.4% in Colbert County and 10.4% in Lauderdale County. The population of the Florence MSA increased by 8.9%, to 142,950, during that decade, the population of Alabama grew by 10.1%. Table 3.3-1 summarizes population trends for the Florence MSA, the two counties, and the State of Alabama.

The area around the site is rural in nature and relatively sparsely populated. The primary population center in the area is located east of the site, extending along both sides of the Tennessee River downstream from the Wilson Dam, and includes the cities of Florence, Muscle Shoals, Sheffield, and Tuscumbia. The 2000 population density, in persons per square mile, is 92.4 for Colbert County, 131.5 for Lauderdale County, and 87.6 for Alabama as a whole (U.S. Census Bureau, January 2002).

Based on the 2000 Census, the minority population constitutes approximately 18% of the total population in Colbert County and 11% in Lauderdale County, compared to 28% for the State of Alabama. The minority population is predominantly black or African American (94% in Colbert County and 91% in Lauderdale County) (U.S. Census Bureau, May 2001).

3.10.5 Housing

The 2000 Census of Population and Housing (U.S. Census Bureau, May 2001) counted 24,980 housing units in Colbert County. The majority of those units, 68%, were owner-occupied, while 22% were renter-occupied and 10% vacant. The housing pattern for the 40,424 units counted in Lauderdale County was very similar: 65% owner-occupied, 24% renter-occupied, and 11% vacant. The number of housing units authorized by building permits in 2000 was 144 in Colbert County and 180 in Lauderdale County (U.S. Census Bureau, January 2002). The median value of residences in the Florence MSA is $100,000 (SEDA, November 2001) and the approximate cost of a 1,800 square foot home with two car garage is between $136,908 (5-10 years old) and $145,188 (new) ADECA, January 2002).

3.10.6 Infrastructure

Electrical service is provided to the industrial park, which has a transmission line running immediately south of the proposed project property. A Tennessee Gas Pipeline natural gas line is located near the site along the eastern side of the industrial park. Potable water is supplied to the site and surrounding areas by the local public water system, Colbert County Rural Water System. The System has recently constructed a 500,000 gallon elevated storage tank, served by an 18-inch diameter water main, within the industrial park.

Sanitary wastewater treatment would be provided to the tissue mill by the Town of Cherokee. The facility is a three cell lagoon which provides secondary treatment and has a permitted capacity of 0.27 MGD. The facility currently handles an average of 0.04 MGD (J. Lister, personal communication, 2002). .

The area has a major municipal solid waste landfill operated by the Shoals Solid Waste Authority (SSWA). It has a remaining life of 28 years. SSWA has another adjacent property which has been investigated for the siting of an expansion of the landfill. A permit to expand is anticipated by SSWA has not yet been approved by ADEM.

The site is served by major highways. The principal arterial roads in the area are U.S. Highways 72 and 43. U.S. Highway 72 is a four-lane divided highway running east-west across the northern part of the state, which passes approximately 1.5 miles south of the site. U.S. Highway 43 runs north-south through the western part of the state and crosses Colbert County

approximately 14 miles east of the site. Interstate 65, the region's major north/south thoroughfare, is approximately 55 miles to the east. Access to the site would be by means of an entrance road, which would connect directly with U.S. Highway 72, to be constructed for the industrial park. Figure 3.3-1 presents the road system in the vicinity of the site and traffic counts available for those roads. The traffic counts, which were all taken on U.S. Highway 72, range from 9,210 to 10,890 vehicles per day. Traffic count data represent 2000 annual average daily traffic (AADT), i.e., number of vehicles passing the traffic count location, in both directions. The stretches of U.S. Highways 72 and 43 that pass through Colbert County are categorized as rural roads with AADTs less than 18,000 (ALDOT, 2000).

The Transportation Improvement Program for Colbert County, developed by the Alabama Department of Transportation (ALDOT), includes one road improvement project: replacement of the westbound overpass/bridge on U.S. Highway 72 crossing Cane Creek, approximately 4 miles east of the proposed tissue mill site (A. Tieg, personal communication, February 2002). The ALDOT is working on the Highway 43 North project that would construct a four-lane arterial to connect the Shoals area (Colbert and Lauderdale Counties) with Tennessee. Also, the proposed tissue mill site lies within the study area for the proposed Memphis to Atlanta Highway, a high priority corridor 7 designated by Congress. Several alignments being considered would follow the alignment of U.S. Highways 72 and 72 Alternate from west to east across the Shoals area (ALDOT, 2000). At least one of the proposed alignments would include a new bridge across the Tennessee River west of the site (SEDA, November 2001).

The site is also near rail, navigation, and air facilities. A mainline track of the Norfolk-Southern railroad is located approximately 1.2 miles south of the site, paralleling Old Lee Highway. The reservoir contains a navigation channel maintained to at least a nine-foot depth by the USACE. The Florence-Lauderdale County Port Authority is a major public port and transloading facility operated by the nearby City of Florence, and several private companies that operate barge terminals also contract those services. About 2000 barge tows pass by the site per year, with an average of about 12 barges per tow, for a total tonnage of about 18 million tons (Dager, personal communication). The Northwest Alabama Regional airport, which serves the tri-state area, is located 15 miles east of the site near Muscle Shoals and the Huntsville International Airport is 65 miles to the east. There is no public transportation available in Colbert or Lauderdale Counties.

3.10.7 Community Facilities and Services

The site lies within the Colbert County school district, which provides public elementary and secondary education. There are three city school districts within Colbert County, Tuscumbia, Muscle Shoals, and Sheffield, and several private and parochial schools in the area. Higher education is provided by the University of North Alabama and by Heritage Christian University, both located in Florence, and the two-year Northwest-Shoals Community College with multiple campuses in the area. There are several hospitals in the Colbert/Lauderdale County area, including Helen Keller, Eliza Coffee Memorial, and Florence Hospitals. Police protection is provided by the Colbert County Sheriff's Department and fire protection by the Barton Volunteer Fire Department. Helen Keller Hospital provides emergency medical service. There have been discussions regarding the extension of nearby City of Cherokee Police and Fire Department services to the site. However, this decision has not been confirmed (F. Wright, personal communication, February 2002).

3.10.8 Recreation

Partly because of the quality of the sport fishery discussed above in section 3.8.2, outdoor recreation is an important aspect of the area economy. An economic impact study of the travel industry conducted for the State of Alabama (CBED, 2001) identified $12 million in travel-related expenditures during 2000 by persons engaged in outdoor recreation activities in Colbert and Lauderdale Counties.

Pickwick Reservoir and Wilson Reservoir support a variety of freshwater-based recreation activities. Public recreational facilities developed by TVA, state, and local governments along the shoreline of the reservoirs support fishing, boating, camping, hunting, swimming, and picnicking. Private recreational facilities are also available.

Located east of the tissue mill site on Cane Creek (on the downstream side near the mouth) is the Cane Creek Boat Ramp. This area is licensed by TVA to the Colbert County Commission. Public access points are limited in the Cane Creek area, so the boat ramp supports a high level of use. TVA property downstream from Cane Creek is used for informal camping and recreation along the shoreline. The reservoir shoreline, in particular the downstream area across Mulberry Creek from the site, where there are numerous residences, is used for recreational activities that involve direct contact with reservoir waters. Those activities include swimming, fishing, and

boating from the shoreline and from docks along the shoreline. Recreational activities are more likely to occur during the warmer weather of the summer months.

TVA allows limited hunting on its property in the area, including TVA lands adjacent to the proposed project property, and private landowners allow hunting on a case-by-case basis. There are no public or private hunting clubs in the vicinity of the site. No hunting is allowed on Barton Riverport Industrial Park property (F. Wright, personal communication, February 2002). Seven Mile Island Wildlife Management Area, located about four miles upstream from the site, is managed primarily for waterfowl hunting by the Game and Fish Division of the ADCNR (TVA, March 1999).

The Natchez Trace Parkway, a scenic highway maintained by the National Park Service, passes through western Colbert County and crosses Pickwick Reservoir approximately 5 miles downstream of the site.

3.11 Noise Levels

Outdoor noise levels in rural residential/agricultural areas typically average 44 decibal (A-weighted) (dB(A)) day-night average sound level (Ldn) (USEPA, 1974), which is the ambient sound level assumed for the proposed site and surrounding area. Local automotive and rail traffic, farm equipment, and barge traffic on the Tennessee River are the primary sources of noise in the area. Two nearby industrial facilities also contribute to ambient noise levels. The Colbert Fossil Plant is approximately 2 miles to the southeast along the river, and operational noise from the plant is audible in the surrounding area, including the eastern portion of the Barton Riverfront Industrial Park. The Muscle Shoals Minerals, Inc. facility, located on Mulberry Lane 1.2 miles south of the site near Old Lee Highway, is a source of noise in that vicinity. The nearest sensitive receptors to the proposed tissue mill site are residents of the Mulberry Lane area to the west across Mulberry Creek. The closest residence is located approximately 650 feet from the westernmost property boundary of the site.

3.12 Archeological/Historical Resources

Two archeological and historical resources surveys (TVA, 1998; 1999a) were conducted for the Barton Riverport Industrial Park development project. These surveys were performed to support the previous EAs conducted by TVA and SEDA (TVA, 1997 and 1999b). These

surveys were conducted by the Alabama State Museum of Natural History of the University of Alabama.

Several sites were identified as having potential cultural significance. However, evaluation of these sites resulted in a determination that none of the sites are included in, or are eligible for, the National Register of Historic Places. This determination was confirmed by the Alabama State Historic Preservation Officer (see TVA, 1997; 1998; 1999a; 1999b).

There are two sites that are in the vicinity of the project area that, while not protected by law and not included in the National Register of Historic Places, should be avoided during construction: 1) the Gilbert House which is south of the proposed Southeast Tissue property and immediately west of the proposed entrance road to be developed by SEDA, and 2) a cemetery which is north of the Gilbert House, south of the proposed Southeast Tissue property and west of the proposed entrance road to be developed by SEDA (Figure 3.5-1). The age of the Gilbert House is undetermined, and therefore, its eligibility for the National Register of Historical Places is uncertain. Although cemeteries are not often considered eligible for inclusion on the National Register, they are protected by law and would be avoided.

Archaeological artifacts have been reported from the river bed in the vicinity of the intake/outfall corridor.

3.13 Aesthetics/Visual Resources

Eastern Colbert County, including the proposed tissue mill site, lies in the Limestone Valley physiographic province, which is characterized by broad, gently sloping areas (NRCS, 1994). The site is in an upland area on a limestone plateau overlooking the Tennessee River Valley. The site and surrounding area consist of a gently rolling landscape covered by a mix of open fields and woodlands. The open fields are either currently cropland or have been used for cropland in recent years. Woodlands border the site on three sides. This mature pine/mixed hardwood forest averages approximately 600 to 700 feet wide and extends along the Tennessee River from Mulberry Creek to the Cane Creek floodplain east of the site. The shoreline of the river is characterized by large limestone cliffs with a relief of approximately 100 feet. The topography also slopes steeply to the west along Mulberry Creek. Views of the site from adjacent properties as well as from across the river are limited by terrain and vegetation. The Colbert Fossil Plant stacks and its associated transmission lines are the dominant visual

features in the vicinity. One of the transmission lines borders the site on the south and two lines cross the Tennessee River immediately upstream of Cane Creek.

Three major categories of vegetation types influence the landscape character of the site area. Natural communities, represented by the woodlands and wetlands around the site, have a natural and undeveloped character. The site itself lies in the agricultural community category. Crops and associated agricultural buildings and facilities produce a rural character. Development associated with the nearby Barton Community can be characterized as residential/commercial landscaped areas. Native vegetation has frequently been removed and has often been replaced with non-native species (such as lawns), and the area has a suburban landscape character. Most of the lands adjacent to the river in the vicinity of the site retain an undeveloped, natural character. The major exceptions are the Colbert Fossil Plant upstream from the site and the residential properties along the western shore of Mulberry Creek and the Tennessee River immediately west of the mouth of Mulberry Creek. The scenic attractiveness of the site would be considered common and the scenic integrity moderate. (J.C Riley, personal communication, 2002)

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Effects on Surface Water Quality of Pickwick Reservoir

The Proposed Action Alternative has the potential to affect river water quality in Pickwick Reservoir during construction or operation. Sediment from construction runoff could damage water quality.. Following construction, wastewater discharged from operation of the mill could potentially affect water chemistry, bacteriology, temperature, dissolved oxygen, and nutrients,. Water quality chemistry could also be harmed by stormwater or inadvertent release of chemicals used at the facility.

4.1.1 Construction

Construction of the intake and discharge structures for the proposed mill could cause impacts on water quality adjacent to and downstream of the site. Installation of the intake structure at the bottom of the river channel, the pump station near the shoreline, and submerged/buried piping between the intake structure and pump station would disturb sediments and temporarily increase turbidity and siltation in the river downstream of the construction area. Construction within the river would involve trenching for and then burial of the water supply and wastewater discharge pipelines within the overbank and installation of the pipeline and intake structures on the bottom of the river channel. The estimated total volume of material to be dredged for the intake and outfall piping is about 5,600 cubic yards. The exact method of dredging for the intake and outfall piping in the reservoir/river has not been defined.

There are also potential effects on reservoir water quality due to erosion from construction of the mill and pipeline on upland areas.

The in-river and on-land construction would be regulated by an ADEM NPDES General Stormwater Permit for construction, the USACE Section 10/404 permit, and the TVA 26a approval. The ADEM permit has been issued and requires implementation and maintenance, to the maximum extent practicable, of effective Best Management Practices. These BMPs would be those applicable measures specified in The Alabama Nonpoint Source Management Program document, approved by EPA, and EPA's own manual, Storm Water Management For Construction Activities - Developing Pollution Prevention Plans And Best Management Practices.Testing and monitoring of the performance of the BMPs.are also required.

Depending on the exact method of dredging adopted, BMPs for work within the reservoir could include using a sealed dredge bucket during trenching work to reduce the downstream transport of dredged and suspended materials, and restricting construction activities in the Reservoir to periods when river flow is low to the maximum extent possible to reduce the potential for downstream movement of dredged and suspended material. In addition, adverse impact to seasonal shallow water and stream habitats within the project area would be minimized by requiring the City, to the extent practicable, to dredge only after the spring spawning season ends in June.

The ADEM NPDES General Stormwater Permit for construction and its requirements would apply to the upland construction activity as well. BMPs required for erosion control. could include minimizing removal of vegetation, particularly woody and shoreline vegetation, and installing stormwater sedimentation basins, drains, ditches, and silt fences before and during construction,

All measures to minimize erosion and sedimentation, whether within the river or from upland areas, would be outlined in a Soil and Erosion Control/Best Management Practices Plan. This plan would be prepared and made available at the site prior to the start of construction-related activity. The aspects of the plan related to construction in the river would be reviewed and approved by TVA and USACE. Construction of the facility would be subject to inspection by ADEM to determine compliance with the plan. Construction of the intake and outfall piping on TVA property would be subject to inspection by TVA to determine compliance with the applicable mitigation measures.

Due to the use of best management practices, the relatively small area of the reservoir affected by the pipeline corridor, the short period of time during which construction in the river would take place (approximately 3 months), and the low level of metal and organic contaminants in the sediments which could contaminate water beyond the effect of sediment alone, TVA has determined that construction impacts on water quality in Pickwick Reservoir and the Tennessee River would be insignificant.

4.1.2 Operation

Wastewater generated by operation of the mill could affect chemistry and bacteriology, temperature, dissolved oxygen, and nutrients. Total projected wastewater flows through all six phases of the proposed mill are noted in the table below.

Phases I - VI
Projected Wastewater Flows

Construction Phase	Projected Wastewater Flow (Average) MGD	Accumulative Flow to POTW MGD	Accumulative Flow to Tennessee River MGD
Phase I – Sanitary	0.01	0.01	
Phase I – Converting	0.03	0.04	
Phase II – Sanitary	0.003	0.013	
Phase II – Converting	3.1		3.1
Phase III – Sanitary	0.008	0.021	
Phase III – Converting	0.03		3.2
Phase IV – Sanitary	0.002	0.023	
Phase IV – Converting	2.1		5.3
Phase V – Sanitary	0.006	0.029	
Phase V – Converting	3.1		8.4
Phase VI – Sanitary	0.006	0.035	
Phase VI – Converting	2.1		10.5

Treatment of the process wastewater would occur after approximately 90% solids removal in the deink plant process clarifiers and recycling of wastewater (approximately 50 to 70%) from these clarifiers. The solids removal, solids dewatering, and recycling of wastewater are integral process components of the deinking operation.

4.1.2.1 Chemistry and Bacteriology

Operational Discharges--Chemical constituents in the mill discharge would have the potential to affect water quality. Data from a mill with similar operations to the proposed Southeast Tissue mill were used to predict the chemical characteristics of the discharge from the proposed facility for the NPDES permit application. The only difference between the mills is that the similar mill uses a sodium hypochlorite process for brightening of pulp, and the proposed mill would employ a brightening process that uses sodium hydrosulfite and possibly hydrogen peroxide, thus avoiding the use of chlorine. Table 2.1-2 RENUMBER 4.1 contains data on the specific

chemical constituent concentrations that are projected to be present in the wastewater discharge from the proposed mill. In establishing effluent limitations for a draft NPDES Permit, ADEM reviewed these chemical constituent concentrations. Based on the 7Q10 and 1Q10 flows and the volume of the discharge, ADEM has determined that the specific constituents in the discharge would not exceed the water quality criteria for protection of aquatic life or human health in the river downstream of the discharge, and they have specified effluent limitations for BOD, TSS, whole effluent toxicity, pH, and temperature. Because the wastewater discharge is expected to comply with all applicable water quality standards, the permit did not set limits for individual toxic substances . The draft NPDES Permit specifies 48-hour acute toxicity bio-monitoring of the discharge at an in-stream waste concentration (IWC) of 4.3% (a dilution factor of about 25) . This concentration is based on results of a computer model used to determine the IWC at the edge of the zone of initial dilution (approximately nine meters from the diffusers). The IWC is the modeled concentration of the discharge, after mixing, in the river during a 1-day, 10-year flow period. Acute toxicity bio-monitoring every three months is specified in the preliminary permit because the ultimate dilution ratio calculated in the permit process is greater than 100:1, and the discharge contains specific chemical constituents that have the potential to be toxic if discharged in excessive amounts. The preliminary permit also requires monitoring of phosphorus and nitrites/nitrates every six months in accordance with an ADEM policy. The modeling for the permit shows that the discharge plume would not hit the swimming area for the residents who live along Mulberry Creek.

The draft NPDES permit uses the 7Q10 and 1Q10 flows to calculate concentrations of the wastewater once mixing has occurred. However, because the reservoir often has no flow at all for extended periods, TVA has also calculated the effect of the discharge on a stagnant reservoir (Hadjerioua, personal communication, 5/22/02). A period of 20 hours was used as a conservative period likely to occur only rarely. Under these conditions the warm discharge would rise to the surface and spread uniformly out from the diffuser, ultimately spreading about 1100 feet from the diffuser in all directions. Thus it would reach the shore on the left side of the reservoir and be wider than the channel and spread into the overbank areas on the right side but not all the way to the shore. It would not reach as far upstream as Colbert Steam Plant but would reach downstream into the Mulberry Creek swimming area (about 925 feet away). The plume would rise to the surface within a radius of about 25 feet from the diffusers in about two and one-half minutes, diluting the original discharge by about a factor of 30 due to the turbulent mixing created by the diffuser design. It would mix with the underlying water as it spreads and

become up to about ten feet thick but more dilute, ultimately by a factor of about 65. TVA estimates that the dilution factor at the swimming area would be about 50 due simply to the spread of the plume. However, if the wind were to be blowing toward the swimming area the plume could reach it with less dilution. Once the plume reached its maximum extent, flow would be likely to begin again in the area, mixing the plume with the reservoir and giving it the elongated shape predicted by the Southeast Tissue modeling and the NPDES permit calculations.

Table 4.2 [Table 12 from the TVA-USACE permit application, altered] compares the expected concentrations of all chemicals in the undiluted discharge and the plume in zero-flow conditions with National Recommended Water Quality Criteria or Alabama Water Quality Criteria for human health or ecological protection. To conservatively assume that wind could transport the plume without additional dilution, the dilution factor of 30 was used. The concentrations in the plume are expected to be well below the criteria. Therefore, TVA has determined that the wastewater discharged to the river would have no effects from chemical toxicity on human health and aquatic life.

Stormwater Discharges—Storm water from the detention ponds/basins would be discharged in accordance with effluent limitations and associated requirements of a NPDES permit. The facility's stormwater controls would be designed for the 25-year, 24-hour storm event.

The characteristics of the discharges that were projected in the NPDES Permit application are provided in the table below and were based on analytical data of stormwater outfalls at a similar mill. The concentration based characteristics of the storm water generated from this mill would likely be similar to those characteristics for the proposed mill.

Stormwater Outfall Characteristics

Constituents (mg/L)				
COD	BOD	TSS	Oil and Grease	Total Phosphorus
110	25	120	< 10	0.4

Because the stormwater discharges would be intermittent and generally during times when the river flow and sediment levels would be high, TVA has determined that they would not have a significant impact on reservoir water quality

Chemical Releases—Unplanned and uncontrolled releases of chemicals used at the plant (as listed in Table 2.1-3.) could also affect chemistry of surface water.. TVA expects that such spills would be very unlikely because the facility would have a Best Management Plan/Stormwater Pollution Prevention Plan (BMP/SWPP) as a requirement of the NPDES Permit. This plan would be prepared and made available at the site prior to start-up of any manufacturing operations to prevent the accidental spill/release of materials and pollutants from the site as a result of an emergency event such as a spill/release, fire, or explosion. It is anticipated that this plan would include the following components:

- Facility Description
- Purpose of Plan
- Plan Authority/Management Approval
- Summary of Plan and Emergency Contacts
- Inventory of Sources/Materials
- Description of Sources/Materials
- Previous History of Spills/Releases
- Potential Spill/Release Events
- Site Drainage
- Containment Measures/Structures
- Spill/Release Prevention Measures, Controls, and Procedures
- Inspections/Records
- Security
- Personnel and Training
- Spill/Release/Emergency Response and Control Procedures
- Reporting Procedures
- Spill/Release Prevention Team
- Site Compliance Evaluation
- Sampling Plan (as required)

The secondary containment structures for chemical storage tanks would be sized to contain the volume of the largest storage tank plus direct rainfall to the containment resulting from the 10-year, 24-hour rainfall event.

Valves would be installed on the secondary containment structures to contain any spills/releases of these materials. These valves would be normally closed. Any material in the structures would only be allowed to drain to the wastewater treatment facility if the material within the structure is storm water only, or after it has been determined that any material within the structure can be handled at the treatment facility with no impact. If there is a substantial spill/release within the containment structure, the chemical/material would be held for appropriate treatment and/or disposal.

Stormwater detention ponds/basins would be used to contain water in the event of a fire or a spill outside of a containment structure. The operation of these basins would be addressed in the BMP/SWPP Plan for the site.

Prior to start of any manufacturing operations at the site, Southeast Tissue would secure a contract with an Emergency Response Contractor who has the capability to address any major spills/releases of materials on the site. This contract also would address the potential for a response in the Tennessee River and its tributaries in the event that a spill or release is not contained on the site within secondary containment structures or stormwater detention ponds/basins.

TVA expects that bacteriological quality of the reservoir would not be affected by the discharge of the mill. The process wastewater would not have a high bacterial load, and the sanitary wastewater would both be a very small amount and would be properly treated by a licensed and permitted publically-operated wastewater treatment plant.

4.1.2.2 Temperature

TVA expects that the Southeast Tissue facility would have a maximum discharge temperature of 90°F (37°C) based on the requirement of the draft NPDES Permit being proposed by ADEM. In addition, the Alabama Water Quality Criteria establish 5°F as the maximum in-stream temperature rise above ambient water temperature in streams, lakes, and reservoirs due to the addition of artificial heat by a discharger (ADEM, December 1992).

To meet these limits, the plant would probably use an aerated stabilization basin treatment process with a wastewater detention time of up to 6 days.. However, the construction of the on-site wastewater treatment facility is a component of Phase II. Therefore, the design of the treatment facility has not yet been finalized.

Modeling performed by ADEM for the NPDES permit application provided information regarding the effect of the wastewater discharge on the river temperature. At the 7Q10 flow of 11,000 cfs, even with a maximum discharge temperature of 99°F and an assumed river temperature of 86°F, modeling data for the full 11.0 MGD discharge indicate that the river temperature at the edge of the outfall plume approximately 0.5 mile from the discharge during summer conditions would only be about 0.1°F above background river conditions. Modeling was also performed during winter conditions with a maximum discharge temperature of 79°F and an assumed river temperature of 43°F. During winter conditions at the 7Q10 flow of the river, the temperature in the outfall plume approximately 150 feet and 3,940 feet downstream of the proposed discharge (where the outfall plume intersects the left bank of the main river channel) would be only 0.7°F and 0.3°F, respectively, above ambient river temperatures.

Calculations by TVA based on the modeling of the dispersion of the plume during periods of zero or reverse flow in the summer, assuming a discharge of 90 F and reservoir temperature of 86 F, indicate that the temperature at the edge of the plume would be barely more than 86 F (Hadjerioua, personal communication)

Based on these small effects, TVA has determined that the discharge from the plant would not have a significant impact on river temperature, provided the temperature of the discharge is limited to 90.

4.1.2.3 Dissolved Oxygen

Bacteria and protozoa in the Tennessee River/Pickwick Reservoir would metabolize residual organics and other wastewater constituents contained in the proposed mill's discharge, resulting in the consumption of DO from the water of the reservoir. The reduction of DO levels in the river due to this BOD has the potential to adversely affect aquatic biota. The principal component of BOD is carbonaceous BOD (CBOD), which is organic matter that consumes DO when aerobically metabolized by bacteria and protozoa. Another component of BOD is dissolved ammonia, which consumes DO when nitrifying bacteria convert it to nitrate (nitrification). BOD may have direct effects on water quality due to its effects on DO levels, which are critical to the

health and survival of river biota, and it may have indirect effects on water quality through the alteration of aquatic community structure due to the differing tolerances of species to low DO levels. The combination of BOD and increased temperature also may have a synergistic adverse impact on aquatic biota.

Based on the draft NPDES permit proposed by ADEM, TVA expects that the proposed mill's discharge would be required to meet the EPA Categorical Limitation Guidelines and Standards for the Pulp and Paper Point Source Category. The EPA categorical based standards are more specifically derived from those standards under 40 CFR Part 430, Subpart I – Secondary Fiber Deink Subcategory where tissue paper is produced and are based on paper production levels. These standards are shown in Table 2.1-1.

ADEM has conducted preliminary water quality modeling for the proposed discharge to the Tennessee River at TRM 242. This modeling was performed based on the following assumptions for the proposed discharge and river conditions.

Discharge Flow = 10 MGD
$CBOD_5$ = 108 mg/L*
$CBOD_5$ = 8966 lbs/day
NH_3-N = 1 mg/L
Dissolved Oxygen = 6 mg/l**
7 Q10 River Flow = 11,000 cfs

* An ultimate-to-five-day CBOD ratio of 4 was assumed for the proposed discharge.
** This DO of 6 mg/l is the DO in the wastewater discharge.

The preliminary modeling predicts a DO sag to about 5.2 mg/L in the river between 10 and 20 miles below the discharge during the months of May through November and to about 6.7 mg/L during the months of December through April. However, the model predicts that DO concentrations in the river do not drop below the water quality standard of 5 mg/L with a 30-day average BOD loading in the discharge of up to 8,966 lbs.

TVA has done additional calculations to estimate the effect of the plume on DO levels during periods of zero flow. In the worst case of 20 hours of zero flow, the DO in the plume is expected to be reduced no more than 0.3 mg/l below what the DO in the river at that location would have been (Hadjerioua, personal communication). (For example, if the DO in the river had been 6.0

mg/l before zero flow began, it would drop to no lower than 5.7 mg/l at that location during the 20 hour period)..Based on analysis of the modeling by ADEM and TVA's own calculations, TVA expects that, adverse impacts on the water quality of Pickwick Reservoir as a result of decreases in DO due to the wastewater discharge from the proposed mill would be insignificant. The state has included monitoring requirements in the draft NPDES permit. Southeast Tissue would have to conduct weekly instream monitoring from May 1 - Oct. 30 for DO. If DO in the river were to fall below 5 mg/L, monitoring would have to be done daily, and Southeast Tissue would have to take steps to ensure their discharge would not decrease the measured DO, possibly including curtailment or suspension of their discharge.

4.1.2.4 Nutrients

The wastewater leaving the proposed tissue mill would be nutrient deficient. Therefore, supplemental nutrients would be added in treating the wastewater to promote the growth of microorganisms and provide adequate treatment. Ammonia (to provide nitrogen) and phosphoric acid (to provide phosphorus) would be added to the wastewater. A capability to add these nutrients at a ratio of 100:5:1 for BOD: ammonia-nitrogen: phosphorous would be provided (Earth Tech, January 2002). Nutrient additions would be monitored to insure that only the minimal quantities required for biological treatment would be added to the wastewater.

After treatment, the nutrients nitrogen (in the forms of ammonia, nitrate, and nitrite), phosphorus (in the form of phosphate), magnesium, and sulfur (in the form of sulfate) would be present in the wastewater discharge from the proposed tissue mill. The mill is projected to discharge ammonia-nitrogen at a daily maximum concentration in wastewater of less than 5 mg/L and at a long-term average value of less than 2 mg/L. Total organic nitrogen is projected to be discharged at a daily maximum concentration of up to approximately 10 mg/L, and phosphorus is projected to be discharged at a daily maximum concentration of up to 1.5 mg/L of total phosphorus and a long-term average value of approximately 0.5 mg/L total phosphorus (Earth Tech, January 2002).

The nutrients are projected to be discharged in the wastewater from the proposed mill at low concentrations and low amounts. As shown in Table 4.2, the only nutrient for which there is a National Recommended Water Quality Criterion is nitrate-nitrite, and this would be discharged at a maximum concentration only half of the criterion. With the dilution factor of 30, this nutrient would be well below levels of concern. The total amounts of nutrients discharged would be a

daily maximum of 924 pounds of total organic nitrogen and a daily average of 46 pounds of phosphorous. In light of the mesotrophic status of the reservoir, these discharges could have a small effect on overall nutrient and chlorophyll levels of the reservoir. Overall, however, TVA considers that the effect would not be significant.

4.2 Effects on Sediment Quality

Chemicals in the wastewater discharge from the proposed tissue mill potentially could accumulate in sediments in the area immediately downstream from the outfall. As discussed in Section 3.1.3.4, existing sediment quality in the area has rated either good or fair based on TVA data collected in their Vital Signs Monitoring Program. A 1998 TVA assessment of sediment quality in Pickwick Reservoir adjacent to the site identified only three metals (mercury, copper, and nickel) and several PAH compounds that exceeded one or more sediment quality reference values. Each of these metals or compounds was predicted to have the potential to cause infrequent, if any, adverse effects on benthic invertebrates at the locations where they exceeded reference values (TVA, October 1998b).

Of these metals and PAHs, only copper is predicted to be a constituent of the wastewater to be discharged from the proposed tissue mill. Copper and the other chemicals predicted to occur in the wastewater discharge would be diluted to very low concentrations in the river and would not have a very strong tendency to partition to the sediments. Therefore, the quantities to be discharged are not expected to noticeably increase sediment concentrations or increase sediment toxicity. Accordingly, the proposed action would not have a significant impact on sediment quality in Pickwick Reservoir.

4.3 Effects on Floodplains

All construction for this facility would be in a zone above the 100- and 500-year flood elevations, with the exception of the outfall/intake pipelines into the Tennessee River, which would be installed below grade to extend into the main river channel. The pipelines therefore would be subject to the requirements of Executive Order 11988, Floodplain Management. For compliance with E.O. 11988, underground water and wastewater lines are considered to be repetitive actions in the floodplain as defined in TVA's "Class Review of Certain Repetitive Actions in the 100-Year Floodplain." Adverse impacts would be minimized by completely

burying the pipes and by removing all excess excavated material and spoiling it on the plateau at the site of the main facility.

4.4 Effect on Wetlands

The jurisdictional wetlands along the shoreline of Pickwick Reservoir below elevation 414 would be affected by construction of the intake and outfall pipelines. Vegetation would be cleared and soil excavated for placement of the pipelines. However, these impacts would be temporary. The pipelines would be placed below existing land surface grade. The pipeline trench would be filled to pre-construction grade, and the corridor would be replaced with natural vegetation (not to include trees in order to protect the pipeline from roots and keep the line accessible for maintenance), with the addition of other erosion control materials such as rip-rap, as appropriate. Routine Best Management Practices for construction such as silt fencing would limit impacts to wetlands outside of the pipeline corridor.

The three small, non-jurisdictional, isolated wetlands on the southeastern corner of the proposed facility property would not be affected by the construction and operation of the facility. The design of the proposed on-site landfill in this area of the property is being developed to avoid impacts to these isolated wetlands.

Based on the limited wetlands present and the temporary duration of the impact, TVA has determined that the impacts would be insignificant.

4.5 Effect on Ground Water

The construction of the proposed tissue mill would have a negligible effect on groundwater resources. It is anticipated that dewatering of the site would not be necessary during construction. Quality control procedures previously described (stormwater pollution prevention, best management practices, and spill prevention control and countermeasures plans) implemented at the site would limit spills or leaks that could introduce contaminants into the ground water beneath the site during construction.

Operation of the proposed tissue mill would not significantly affect groundwater levels in the vicinity of the site. The introduction of impervious areas (buildings, pavement, and other impervious surfaces) would slightly decrease the recharge rate of precipitation to the groundwater aquifer. Groundwater quality would not be adversely impacted by operation of the

proposed tissue mill, wastewater treatment facilities, and potential associated landfill. Spill prevention practices employed in the operation of the tissue mill would limit the introduction of contaminants into the ground water at the site. The wastewater treatment basins and the landfill would be designed and operated in a way that would not adversely affect groundwater quality.

Southeast Tissue is specifically requiring that the landfill be designed to meet state standards for industrial waste landfills. Groundwater monitoring wells would be installed as part of the water quality monitoring effort. The landfill design would include a composite liner system as well as a leachate collection and removal system. Composite liner and leachate collection and removal systems have been shown to be very effective at preventing leachate from migrating out of landfills and impacting ground water.

As part of the landfill permit application, a Design Hydrogeologic Report is required to be prepared. The purpose of this report is to provide detailed and localized data on the hydrogeologic regime for this area in order to design an effective water quality monitoring system. A Water Quality Monitoring Plan would be included in this report. The purpose of this plan is to provide early detection of any release of hazardous constituents to the uppermost aquifer, to protect public health and the environment. A hydrogeological investigation has been conducted and will be submitted to ADEM as required. Based on landfill permitting restrictions, the potential impacts of the proposed action would not be significant.

4.6 Effect on Air Quality

Air quality would be affected by both construction and operation of the facility. Construction equipment, possibly including a mobile concrete plant, and vehicular traffic would be the principal sources of air emissions during facility construction. Site clearing and grading would create potential sources for fugitive dust. These impacts would be episodic and end with the completion of each phase of construction. Impacts from fugitive dust would be minimized through the use of appropriate control measures such as the application of water on an as needed basis and revegetation of disturbed areas as soon as practicable. Open burning provisions would be complied with during land clearing activities.

Operational air emissions sources would be vehicular and rail traffic, materials handling areas, support facilities and equipment, and process equipment. The process equipment includes the following air pollutant sources; recycle fiber and deink operations, paper machines with air cap

dryers (process heater), letterpress printing operations, and package boilers for each paper machine.

The primary emissions expected from operation of the proposed facility include NO_x, SO_2, VOCs, total suspended particulate (TSP), PM_{10}, and CO. Facility-wide emission estimates are presented in the table below. The Southeast Tissue facility would have potential NOx, VOC, SO_2, TSP, and CO emissions above the 100 ton per year (tpy) major source threshold for the purpose of the Title V operating permit program, but the company has elected to voluntarily accept a federally enforceable limit to restrict VOC, NO_x, and SO_2 emissions below the 250 tpy PSD threshold. All other criteria pollutants are below the 250 tpy PSD applicability limit.

Summary of Potential Annual Emissions
Phases I - VI

Pollutant	Total Facility Potential Emissions(1) (tons/year)
Total Suspended Particulate (TSP)	158
Particulate Matter (PM-10)	78
Sulfur Dioxide (SO_2)	249
Carbon Monoxide (CO)	135.0
Nitrogen Oxides (NOx)	249
Volatile Organic Compounds (VOCs)	249
Total Hazardous Air Pollutants (HAPs)	4.4

(1) Potential emission estimates are based on either the maximum allowed by permit limits requested in the permit application, or, if there is no permit limit requested, the emissions that occur from continuous operation at maximum capacity.

The facility would be a small source for hazardous air pollutants (HAPs). There would be no control requirements under the MACT III pulp and paper NESHAP because those rules only apply to major sources of HAPs with deink plants that use chorine or chlorine dioxide to brighten pulp. EPA has determined that pulping and paper making systems at secondary fiber mills do not emit significant quantities of HAPs, and EPA is not aware of any reasonable technologies for controlling the small quantities of HAPs emitted from these sources. Air dispersion modeling was performed by Earth Tech for all TLV chemicals that have potential emission rates greater than de minimis levels from all operations assuming worst-case dispersion conditions. The modeling results indicate that the off-site 1-hour concentration for all chemicals would be less than the screening concentrations required by the ADEM Air Toxics Program.

The projected increase in truck and passenger vehicle traffic (306 and 1,350 trips daily, respectively, are relatively small in terms of emissions and are not expected to have an impact on air quality or the ozone attainment status of the region.

An Air Construction Permit application for the proposed mill was submitted to ADEM on February 25, 2002, and revisions to this permit application were submitted on March 13, 2002. The air permit application is based on Southeast Tissue's decision to voluntarily accept federally enforceable permit conditions to limit emission levels below the PSD threshold.

Because the facility is not a kraft pulping mill it would have negligible odor.

Based on the requirements of regulations restricting the emissions of air contaminants and compliance with those regulations, the effects of the proposed action on air quality would not be significant.

4.7 Effects on Terrestrial Ecology

The terrestrial ecology at the site of the proposed tissue mill would be impacted by the removal of vegetation in the areas to be developed. An aerial view of the terrestrial communities of the site is provided in Figure 1.1-3, which shows the spatial relationships between major terrestrial communities and the planned locations of facilities. (The exact locations of the facilities and the grading plan for the site have not been finalized, so the locations shown are approximations.)

The majority of the proposed facilities on the property would be located on agricultural fields, as would the railway and roadway. The potentially affected agricultural fields provide poor habitat for native biota, and their conversion to industrial use would have negligible adverse effects on the terrestrial biota of the site. The three small, discrete wetland areas, surrounded by agricultural land in the southeastern area of the property, are not expected to be impacted by the proposed facility.

The other terrestrial communities that would be affected by construction of the proposed mill are the upland pine forest and mixed forest communities. Stands of upland pine forest would be removed from three areas: (1) the north end of the property, extending from the north corner of the manufacturing facility area to the proposed locations for the wastewater basins, the stormwater basin for Outfall 002, and the water treatment facility; (2) the southwest portions of the proposed facility property; and (3) smaller areas along the margin of the upland mixed forest to the north of the agricultural fields. The pines trees of this forest appear to have been planted about 12 years ago, and the community is relatively low in species diversity and contains no rare habitats or uncommon species. Removal of the upland pine forest community would displace wildlife from these areas, but this would have a minimal effect on the terrestrial biota of the site vicinity.

Relatively small areas of the upland mixed forest community also would be cleared for construction of proposed tissue mill facilities. Figure 1.1-3 shows that the areas of mixed forest most likely to be affected by the proposed siting of facilities are: (1) the pipeline corridor from the north corner of the property to the shore of Pickwick Reservoir, (2) the stormwater basin on

the northern edge of the site near the reservoir and a narrow pipeline corridor extending to the reservoir, and (3) the railway corridor where it traverses the northern and eastern areas of the property. Removal of the mixed forest from these areas would displace wildlife in the short term. However, these areas would be revegetated with grasses and other herbaceous vegetation, and, over the long term, the habitat edges and diversity created by these openings in the forest are expected to mitigate adverse effects on wildlife. Also, these areas are contiguous with large areas of unaltered forest. Many inhabitants of the mixed forest would be able to relocate to unaffected areas along the river and southeast of the property.

The riparian mixed forest covering the TVA property along the reservoir and Mulberry Creek would not be affected except for the clearing the pipeline corridor. The intake pipeline and the pipeline to Outfall 001 would be installed within a 75-foot-wide corridor extending from the northeast corner of the site across forested TVA property to the shore of Pickwick Reservoir upstream of the mouth of Mulberry Creek. The water intake structure and pump station would be constructed within the corridor near the shoreline, with a 50- to 75-foot buffer of riparian forest remaining between the structure and the reservoir. There are no rare habitats or uncommon species in the potentially affected areas of the mixed forest community.

Terrestrial wildlife in adjacent areas not directly impacted by construction of the facility would likely be adversely affected in the short term by disturbances from the construction. Disturbance primarily would result from increased noise levels, vehicle traffic, human presence, and short-term loss of available nesting and foraging habitat. These potential impacts would occur principally during periods of heavy construction and primarily during the daytime. In addition, loss of habitat for those species that utilize areas within the footprint of the proposed facilities may cause short-term competition between displaced and nondisplaced wildlife.

Operations at the facility are expected to have a minimal effect on adjacent wildlife communities. While displacement of noise-sensitive species could occur, overall habitat loss and human activity levels are not expected to result in significant long-term impacts because of the amount of unaltered habitat that is available in contiguous areas. All area floodlighting, roadway lighting, and building or structure perimeter illumination would utilize lighting fixtures to optimize light utilization and minimize spill light and glare. The intake structure near the reservoir would likely be illuminated by directed lighting that would be activated only during operation and maintenance of the structure. These lighting features are expected to have no appreciable

effect on wildlife. In addition, the facility landfill would not likely attract wildlife, as it would receive only non-putrescible, process wastes.

In summary, TVA has determined that the construction and operation of the proposed tissue mill would not have significant effects on the terrestrial ecology of the site and adjacent areas.

4.8 Effect on Aquatic Ecology

Aquatic ecology of Pickwick Reservoir could be affected by all the factors affecting water quality discussed in section 4.1 above—sediment from construction runoff; effects of wastewater discharges on chemistry, temperature, dissolved oxygen, and nutrients; stormwater runoff from the developed site; and chemical releases. As discussed in section 4.1, the impacts of these factors on water quality are expected to be insignificant, and TVA expects that this would generally result in insignificant impacts on common aquatic organisms. Some specific potential impacts are discussed further here.

Construction of the intake and outfall lines would kill any mussels or other sedentary organisms living where the trenching would occur. However the limited mussel encounters in the surveys conducted by TVA in the area indicate that the habitat does not support enough mussels to warrant relocating the lines or searching for and relocating any mussels along the route of the lines.

Some aquatic organisms would be killed by impingement and entrainment due to the water intake. Impingement occurs when organisms, particularly fish, are trapped against intake screens by the force of water passing through the water intake structure. It can result in death due to starvation, exhaustion, asphyxiation, and injury. Entrainment occurs when organisms are drawn through the intake screen into the intake piping and accompany the process water into the facility. Organisms that become entrained are relatively small benthic, planktonic (free-floating), and nektonic (free-swimming) organisms, including eggs and early life stages of fish and invertebrates. Death can be due to chemical or mechanical aspects of the processing.

The projected surface water withdrawal rate at full build-out of the proposed mill is 11 MGD (=17.02 cfs), approximately 0.15% of the 7Q10 flow of the river and 0.032% of the average annual river flow. Even during a 19-hour period of zero flow (which would occur about 1 day in three years) the withdrawal would take an infinitesimal portion of the volume of the. Therefore, TVA expects that the intake would not affect enough of the flow or volume of the river to change

reservoir conditions or have a significant entrainment or impingement of the resident aquatic life in the river.

The intake structures for the proposed tissue mill would be designed based on the best technology available to further mitigate effects on aquatic biota by minimizing impingement and entrainment of aquatic organisms, particularly fish. The two intake screens would be located at the edge of the main river channel and as close as possible to the bottom of the channel. The screens of the intake structure would have fine slot openings of 0.125 in (1/8 in or 3.2 mm), in accordance with TVA Act 26A Standard Conditions, to minimize the size of the organisms that can pass through the slots and become entrained. The velocity with which water passes through the slots would be low to minimize impingement. With two screens, the through-screen intake velocity would be no more than 0.25 fps at the full build-out flow of 11 MGD. In addition, the intake screen structures would be oriented parallel to the river flow, and the slot openings of the screen would be oriented perpendicular to the river flow in order to further reduce the potential for entrainment. A manual air burst device would be incorporated into the design to clean debris from the screen. This device would also have the effect of dislodging impinged fish and other organisms from the screen. TVA expects that he extended plume of warm nutrient rich discharge would have limited effect on bottom-dwelling organisms and those organisms living in the water column. Its full development would be rare (only about once every three years for the full 19 hours of zero flow). It would grow slowly, allowing fish to pass by it most of the time, and even fully developed it would only lie along the surface of the reservoir. Also,

As discussed above, the discharge from the plant outfall would rise to the surface and begin to mix with other water in the river. The design of the ports on the outlet structure would ensure that virtually no native mussels and other aquatic life living on the river bottom would be exposed to the undiluted discharge. Under all flow conditions, the plant discharge would be mixed with the much larger volume of water in the river before it would recirculate and come into contact with aquatic life on the bottom some distance downstream from the plant. By that time, the discharge would be diluted to the point that no detectable adverse effects would occur. When there was little or no flow in the adjacent part of Pickwick Reservoir, the discharge would accumulate at the water surface all across this part of the river and, during long low-flow periods, could extend as much as 10 feet down toward the bottom. Bottom-dwelling animals would be exposed to this slightly heated, nutrient-rich water in the overbank areas and could be adversely affected by the high temperature, increased concentrations of suspended solids and

nutrients, and, if the material stayed there long enough, reduced dissolved oxygen levels. However, TVA expects impacts would be insignificant due to the rapid cooling of the warm discharge by the reservoir, a dilution factor of at least 30 within the plume, limited oxidation of the organic material in the plume during the time of zero flow, and the rarity of zero flow occurrences long enough for the plume to extend into the shallow overbank areas where it might touch bottom.

Based on the Best Management Practices and design features of the proposed facility, TVA expects that the construction and operation of the proposed tissue mill would not have significant effects on aquatic ecology.

4.9 Endangered, Threatened, and Rare Species

The information presented in Section 3.9 indicates that two plants protected in Alabama (Dutchman's breeches and Enemion) and two federally-listed terrestrial animals (gray bat and bald eagle) might be affected by activities on the project site. In addition, up to nine protected aquatic animals (all native mussels) could occur in the Tennessee River in the general vicinity of the project site; however, none of those mussel species is likely to be present where the intake and discharge pipes would be built and operated.

As shown in Figure 3.2-1, the Dutchman's breeches and Enemion are present within the presently identified corridor for the intake and discharge lines. The population of Dutchman's breeches is more widespread and crosses the entire corridor, including the temporary construction easement, and some of the plants would be destroyed by the trenching for the pipes and destroyed if not previously removed and transplanted. The Enemion lies along the eastern edge of the corridor, and if the lines were laid along the western side of the corridor the plants would not be destroyed by construction itself. However, plants of both populations could die following construction if clearing of the corridor removed enough vegetation to allow extensive sunlight into the area or excessively compacted soils.

The population of Dutchman's breeches is one of 18 recorded populations in the state, and at least one of those populations has thousands of specimens. The loss of some specimens of the population on the site would be undesirable and should be minimized but would not, in TVA's determination, be significant. The Enemion is much rarer within the state. There are only two other known populations, the closer one 10-15 miles away. One of the two populations has

fewer than 150 plants, and the other has about 1000. Therefore, the loss of any individuals of the population on the site would be more serious, and, in TVA's opinion, possibly significant.

To minimize the impacts to the plants, TVA would require that the engineering firm designing the intake and outfall lines prepare a construction plan for the lines to be located as far to the west within the ravine as feasible given the presence of rock bluffs, moving the corridor itself if necessary. Within the ultimately selected corridor, clearing would be minimized to minimize increase of sunlight and soil compaction. If the lines could not be moved far enough west to avoid all the Dutchman's breeches plants the engineering firm would develop and implement a transplantation and monitoring plan. TVA would review and approve the construction and monitoring plans.

Construction and operation of the proposed mill would not prevent the gray bat or the bald eagle from using the reach of Pickwick Reservoir adjacent to the site.. The riparian forest lining the reservoir on TVA property and portions of the site would remain as a buffer between the facility and the reservoir, limiting disturbance from construction and operations at the proposed facility. In the short term, the two species potentially could avoid the immediate area of the facility and forage in the unaltered habitat available in contiguous areas. Over the long term, habituation to the presence of the facility is expected to occur, and these species are not expected to avoid the reach of river adjacent to the site. Accordingly, the construction and operation of the proposed tissue mill would not be expected to have significant adverse effects on terrestrial ETR species.

As indicated in Section 4.8, construction of the intake and outfall pipelines could have minor effects on native mussel stocks in the areas where that activity would occur. The results from the survey conducted along the project area, however, indicate that few native mussels occur in that area and that no protected species were encountered there. Both parts of those survey results indicate that construction of the pipelines would not have any adverse effect on protected mussel species.

Operation of the intake and discharge could affect protected mussels in the same way that it could affect common native mussels. However, TVA expects that there would be no adverse impacts to protected mussels for the same reasons as discussed in Section 4.8—limited water withdrawals, rapid cooling of the warm discharge by the reservoir, a dilution factor of at least 30 within the plume even during zero flow, limited oxidation of the organic material in the plume

during the time of zero flow, and the rarity of zero flow occurrences long enough for the plume to extend into the shallow overbank areas where it might touch bottom.

Based on the required mitigation for effects on rare plants from constructing the water and discharge lines, use of Best Management Practices in construction, and design features of the proposed facility, TVA expects that the construction and operation of the proposed tissue mill would not have significant effects on endangered, threatened, or rare species.

4.10 Socioeconomic Effects

4.10.1 Effect on Land Use

The proposed mill would change the current use of the site from agriculture to industry. However, the site has been intended for industrial use since the late 1990's, so agriculture is already recognized as an interim use. The environmental reviews done by TVA for the creation of the industrial park assessed the effects of industrial use of the site on the agricultural industry and the supply of prime farmland in Colbert County and determined that the impacts would be minor

Operation of the proposed mill is not expected to have long term impacts on any other aspects of land use. Because the tissue mill would use 100% recycle furnish for raw material, no timber harvesting or logging activities would be associated with the proposed tissue mill. The mill would not impact existing recreational land uses in the area, which include principally boat launching facilities on Cane Creek.

4.10.2 Employment

Construction and operation of the proposed tissue mill would have a beneficial impact on employment in the area. A maximum of 400 – 450 workers, most of them from the local labor supply, would be employed during construction of Phases I, II, and III of the tissue mill and 300 – 400 workers would be employed during each of the subsequent phases of construction. This would be about 10% of the current construction and mining employment in Colbert and Lauderdale Counties (December 2001 workforce).

The table below lists the employment levels for the various phases of the project. Southeast Tissue expects that many employees would be recruited from the local population. As noted in

Chapter 3, the area has an available supply of workers to fill the new jobs associated with the tissue mill.

Phases I - VI
Mill Employment

Phase	Administrative Personnel	Operating Personnel	Accumulative Employment Total
Phase I	18	180	198
Phase II	16	52	266
Phase III	8	145	419
Phase IV	8	32	459
Phase V	8	100	567
Phase VI	8	100	675

As discussed above in this chapter, the Southeast Tissue facility is not expected to have significant impacts on water quality or mussels, so TVA expects there would be no impact on the regionally important commercial musselling industry.

4.10.3 Income

Construction and operation of the tissue mill would have a beneficial impact on income levels in the area. Through Phase IV, the total investment would be approximately $329 million. (Expenditures are not yet determined for Phases V and VI.) The company expects that approximately 7.5% of the project cost would be spent locally, on items such as concrete, rebar, cleaning services, and supplies (approximately $3.4 million for Phase I and $24.7 million for project build-out). Specialized process equipment would have to be brought in from out of the area.

The projected annual payroll for the mill at the end of Phases I – IV is $22 million. On-site trucking would most likely be contracted with a local company. This includes moving trailers around the facility and hauling sludge from the tissue mill to the on-site landfill. Annual expenditures for these services would be in addition to the payroll.

4.10.4 Population

Construction of the proposed tissue mill would have little impact on the population of northwestern Alabama. Many of the workers employed to construct the mill are expected to be

local or regional residents, and workers from outside of the region would probably remain in the area only until construction is complete as is typical of relatively short-term construction projects. Most would either not have wives and children, and of the ones who do, most would not bring them along.

Operation of the tissue mill would not have a significant effect on the local or regional population. The year 2000 population of Colbert and Lauderdale Counties is 142,950 (see Table 3.3-1). Once in operation, the tissue mill would employ from approximately 198 workers for Phase I to a maximum of 675 persons at build-out with additional support persons such as truckers, sludge/leachate contractors, electricians, and pipe fitters. Southeast Tissue believes there is an adequate supply of skilled labor within a 25 to 40 miles radius of Barton and plans to recruit the majority of the workforce from the local population. A few managers and specialists would be brought in from outside of the area. Even if all of these employees had wives and children, the numbers of residents added would be negligible in comparison to the existing population. There would be no displacement of population by this project.

4.10.5 Housing

Workers brought in from outside of the area for construction or operation of the proposed tissue mill would require either rental units or private residences. Probably some would bring their own trailers for use as living quarters. Adequate housing supply exists in the area to accommodate out-of-town construction workers. The housing vacancy rate was 10.1% in Colbert County and 10.7% in Lauderdale County at the time of the last census (2000).

Southeast Tissue plans to recruit the majority of the workforce from the local population, and these workers would either have homes already or would be obtaining them anyway. The remaining employees who would be brought in from out of the area would likely be able to find available local housing. Local vacancy rates were approximately 10% in 2000. A positive impact from the project is that modest additional demand for new home construction is likely, adding to the available housing supply. Building permit activity in 2000 for new residential construction included 144 units in Colbert County and 180 units in Lauderdale County. The small demand for additional houses would have little effect on housing prices.

4.10.6 Infrastructure

Construction of the tissue mill would require use of utilities, including electricity, natural gas, potable water, sanitary wastewater treatment, and solid/hazardous waste disposal. Motor vehicle and rail traffic also would be generated by delivery of plant equipment and construction materials. The facility could affect navigation past the site.

The electric, gas, water, and wastewater utilities available to the tissue mill have adequate capacity to serve the facility. The 30- to 36-inch diameter Tennessee Gas Pipeline natural gas line located along the eastern side of the Barton Industrial Park can handle the demand for natural gas of 11,000 cfm at build-out (assuming maximum capacity 24 hours per day, 365 days per year). The TVA electrical transmission line immediately south of the proposed mill site could supply the electric power demand of 91.8 MW at buildout. The Colbert County Rural Water System has adequate capacity to provide potable water to the mill with the new 500,000 gallon elevated storage tank at the Barton Industrial Park and a new 2.5 MGD potable water plant under construction with the potential to expand to 5 MGD. As discussed above, the project is not expected to have a significant effect on surface water quality or groundwater quality or quantity, and thus the supply of surface or ground water for utilities. The town of Cherokee wastewater treatment plant, with capacity to treat approximately 0.270 MGD of wastewater per day and current flow of 0.04 MGD, could handle the sanitary wastewater flow from the tissue mill (approximately 0.035 MGD at build-out) and the initial wastewater from the converting operations (Phase I), with an estimated flow of 0.030 MGD. The town has reviewed the proposed SID Permit and has indicated that they have no problems with the proposed discharge (Lister, personal communication).

The facility would produce large amounts of process waste. Approval of the disposal of the process waste, whether in the SSWA landfill or an onsite landfill, would require approval from ADEM. Total projected solid waste generation rates for all six phases of the proposed mill are shown in the table below.

Phases I - VI
Solid Waste Generation

Construction Phase	Total Solid Waste Wet Tons/Year	Accumulative Total Solid Waste Generation Wet Tons/Year
Phase I	Converting Operation Only	0
Phase II	70,500	70,500

Construction Phase	Total Solid Waste Wet Tons/Year	Accumulative Total Solid Waste Generation Wet Tons/Year
Phase III	Converting Operation Only	70,500
Phase IV	45,000	115,500
Phase V	70,500	186,000
Phase VI	45,000	231,000

With acceptance of the proposed mill's solid waste generated from all six phases, the existing SSWA's landfill disposal capacitywould be reduced from 28 years to 18 years. The proposed expansion on the adjacent property would extend the SSWA's disposal capacity14 years in the absence of the process waste.for a total of 52 years With acceptance of this mill's solid waste from four papermachines, that disposal capacity would be reduced to 32 years. (Welch, personal communication)

The facility would also produce moderate amounts of typical solid waste which could be placed in the SSWA landfill with no more effect than any waste from any other large office facility. This amount of waste would be within the normal expectations and planning for solid waste generation in the community and would not affect capacity of the SSWA landfill unduly. . ,

Based on this information, TVA has determined that the impacts of the proposed mill's generation of solid waste would be insignificant.

The mill would be a small quantity generator of hazardous wastes (parts washer cleaner solution, waste lubricating oil, paint waste). These would be shipped to a permitted off-site recycling facility. No hazardous wastes generated by the facility would be classified as "Extremely Hazardous" wastes.

Traffic generated by commuting workers and delivery trucks has the potential to increase the load on area streets/roads. With no public transportation in the area, all employees are expected to drive their own vehicles. The largest number of construction employees at one time, about 450 for each of the first three phases, would generate about 900 trips per day. At initial operation, the projected 198 employees would generate about 396 trips per day, and at build-out, the operating work force of approximately 675 employees would generate approximately 1,350 vehicle trips would be generated daily. These would be distributed over three shifts, with probably about 50% generated for the first shift.

Incoming truck shipments would carry waste paper, supplies, and product made at other sites to be distributed or converted by the proposed tissue mill. Trucks would also be used to transport the manufactured paper. The table below shows projected truck traffic to and from the facility.

Phases I – VI
Truck Traffic Level (1)

Phase	Finished Product Truck Traffic Units/Day	Incoming Supplies Truck Traffic Units/Day	Wastepaper Truck Traffic Units/Day	Accumulative Truck Traffic Total Units/Day
Phase I	28	24	0	52
Phase II	0	0	20	72
Phase III	30	35	0	137
Phase IV	0	0	16	153
Phase V	28	24	20	225
Phase VI	30	35	16	306

(1) Includes Incoming and Outgoing Traffic

At project build-out, an estimated 190 trucks per day would bring in materials and an estimated 116 truck shipments daily would transport finished product, for a total of, 306 truck trips each day. Most truck traffic is expected to occur during daylight hours, with at least 50% during the first (day) shift. The truck traffic would use the new entrance road to the Barton Industrial Park to U.S. Highway 72.

The 900 vehicle trips generated by initial construction would be 8-10% of existing traffic on US 72. As a major 4-lane highway this road has considerable excess capacity, so the additional traffic would not be a significant impact. The vehicle trips generated by Phase I commuting workers plus truck shipments represent an increase in existing traffic levels on U.S. Highway 72 of 4 to 5%, which would have even less impact, especially considering the spread of daily trips over 24 hours

The heaviest levels of traffic would occur during the expansion phases of the project after the tissue mill is already in operation. The highest potential traffic volume would occur during construction of the final phase, Phase VI. At that time, between 300 and 400 construction workers would be required, generating 600 to 800 vehicle trips per day. (The maximum value of 800 trips is assumed for this evaluation.) The 567 workers expected to be employed at the tissue mill upon completion of the previous phase, Phase V, would generate approximately 1,134 daily vehicle trips and there would be approximately 225 truck trips each day. The total

traffic generated by construction activities and operation of the proposed tissue mill during construction of the final phase would be 2,159 vehicle trips per day.

This worst case situation represents an increase in existing traffic levels on U.S. Highway 72 of 20 to 23%. Currently, U.S. 72 has adequate capacity to handle this additional traffic without a significant impact. Moreover, the overlap of construction and operational traffic would be only temporary until Phase VI would be completed. By the time this situation would occur, probably 15-20 years in the future, existing traffic levels on U.S. Highway 72 would be considerably higher given current trends, possibly leading to a significant impact. However, at least some of the currently planned road improvements would probably have been completed by then, increasing capacity, and over this length of time other highway systems improvements are probable. Therefore, TVA expects that even these future traffic impacts would be insignificant.

Approximately two railcars per day of waste paper would be transported into the tissue mill for Phases I – III and approximately six to eight railcars per day in one incoming train per day at project build-out. In addition, an average of one railcar per week of materials/chemicals used in the manufacturing process would be brought in for Phases I – III and six railcars per week for build-out. There would be no outgoing shipments of finished product (finished product is not shipped by rail). The railcars would be moved off-site empty in one outgoing train per day.

The railroad spur line would be constructed off of the main Norfolk Southern rail line that runs parallel to Highway 72. Use of the rail spur would require traffic on Road 35/Cane Creek Road to wait while the train crosses the road. The timing of rail shipments would be worked out with the local authorities to avoid peak traffic times in the morning and afternoon in order to reduce interference with traffic. It would not be difficult to adjust the timing for such a small amount of rail traffic. Proper safety measures, such as automatic grade crossing warning devices, would be installed at the Cane Creek Road crossing.

The mill would not generate barge traffic except for transportation of Yankee Dryers to the site every few years, but construction of the intake and the diffuser outfall would be a temporary obstruction to barge traffic. USACE would require notification from the contractor responsible for constructing the intake and outfall prior to beginning construction. This would allow the USACE to issue public notices to inform navigation interests of the temporary obstructions.

4.10.7 Community Facilities and Services

The presence of the new industrial facility would increase the need for police and fire protection and emergency medical services. On-site hazard reviews would be conducted with facility fire and hazardous materials crews. Emergency response procedures would be developed and coordinated with local firefighting and emergency response teams. The employees to be brought into the area for construction and operation, anticipated to be only a small portion of the projected total employees, would slightly increase the use of public schools, community police and fire protection, and medical care, and emergency medical services. The increase in demand would not be significant and would not require expansion of any of these facilities and services.

4.10.8 Recreation

Outdoor recreation in the area of the project site is centered around Pickwick Reservoir. As discussed above relative to surface water quality, construction of intake and discharge structures in the river and on the site has the potential to temporarily affect recreational use of the river. Southeast Tissue would minimize these impacts through timing of construction activities, control measures to reduce sediment disruption and downstream transport, and erosion control procedures along the shoreline. The construction activity would be a minor temporary obstruction to recreational boaters, but not a serious impediment. Lights and signs would serve to warn boaters.

Operation of the proposed tissue mill would not interfere with recreational use of Pickwick Reservoir. Structures associated with a raw water intake and effluent discharge would not hinder boating or bank fishing. The effluent discharged into the river would meet all state standards for protection of public health and extremely dilute by the time it would reach the swimming area near Mulberry Creek downstream of the site.

Therefore, TVA expects that there would not be a significant impact on recreational use of the reservoir.

4.10.9 Environmental Justice

Under Executive Order 12898, federal actions must address environmental justice, the principle that minority and low income populations should not bear a disproportionate share of adverse

human health or environmental effects from any proposed action. Public involvement and data collection efforts are central to the identification and consideration of environmental justice issues.

In the public scoping meeting on February 26, 2002, local residents had an opportunity to exchange information on issues associated with environmental justice. The public scoping meeting was advertised in the local newspaper in order to encourage public participation. No comments were made concerning disproportionate adverse impacts to minority and low-income populations .

Demographic information on ethnicity, race, and economic status is also an indicator of whether disproportionate adverse impacts can be expected. The area around the proposed tissue mill site is rural in nature and relatively sparsely populated and there is no concentration of minority or low income persons in the local population to be disproportionately adversely affected. Therefore, environmental justice is not a concern associated with construction and operation of the proposed tissue mill.

In summary, TVA expects that the construction and operation of the proposed tissue mill would not have significant effects on socioeconomic conditions in the area.

4.11 Effects on Noise Levels

4.11.1 Construction

Potential sources of noise during construction of the tissue mill facility would be on-site construction activities and off-site transportation, including worker traffic and delivery of equipment and construction materials. These impacts would be temporary and would decline with the end of site grading and heavy construction.

There would be a temporary increase in ambient noise levels during construction because of operation of construction equipment. Earthmoving equipment (e.g., dozers, graders, dump trucks) and materials handling equipment (e.g., concrete mixers, cranes) would be the primary on-site sources of noise. Noise levels would generally be higher during the phases of construction that utilize these kinds of equipment, such as excavation and grading. Outdoor construction activities would most likely be limited to daytime hours when increased noise levels would be less noticeable to local residents.

Traffic entering and leaving the construction site would increase noise levels along local streets. The overall noise level would depend on the types of vehicles and the traffic volumes. The greatest noise levels would be generated during the phases of construction in which heavy trucks make frequent trips to the site, which is only a portion of the total construction time. Construction of Phase I of the tissue mill facility is expected to take approximately 10-12 months. The remaining five phases of construction would occur over a 15 to 20 year period with an assumed construction time for each additional phase of approximately 15 to 18 months.

Due to the episodic and temporary nature of construction noise, the distance to homes from the area of the site where heavy equipment would be generating the most noise, and that the construction activity would generally be limited to daylight hours, TVA has determined that the impact of construction noise would be insignificant.

In addition to affecting humans, construction noise could affect wildlife. These impacts are discussed in section 4.7 above.

4.11.2 Operation

Noise produced by operation of the tissue mill would include two components: operational (on-site) and transportation (off-site). The operational noise generated by the tissue mill is expected to be continuous in nature and relatively steady state (non-fluctuating). Most process equipment would be inside the facility. However, the wastewater treatment plant would have approximately fifteen 100-hp or twenty 75-hp aerators outside at build-out. The intake structure would initially have two 150-hp pumps, and a maximum of four at build-out, located at the pump station on the shore of the reservoir.

Because the human ear can detect a wide range of sound pressure levels, they are measured on a logarithmic scale with units of decibels (dB). The A-weighting is most commonly used and is intended to approximate the frequency response of our hearing system. It weights lower frequencies as less important than mid- and higher- frequency sounds. The day-night average sound level (Ldn) is the 24-hour A-weighted equivalent sound level, with a 10 dB penalty applied to nighttime levels.

Estimated noise levels at the nearest residence resulting from operation of the wastewater treatment plant aerators and the intake structure pumps were calculated using standard noise equations (Cowan, 1994). The following site-specific information was used in the calculations.

Wastewater Treatment Plant Aerators

- Fifteen 100-hp aerators, each producing 77 dB(A) at 12 feet (add 12 dB to adjust for multiple sources = 89 dB(A)) , or
- twenty 75-hp aerators, each producing 76 dB(A) at 15 feet (add 13 dB to adjust for multiple sources = 89 dB(A)).
- Nearest residence approximately 1,250 feet west of the closest edge of the aeration basins.
- Attenuation, due to 250 feet of dense deciduous forest between the aerators and the nearest residence, of 19.5 dB during the summer and 14.5 dB during the winter (assuming 5 dB of attenuation is due to leaves) (as per Beranek and Ver, 1992 and Price et al., 1988).

Intake Structure Pumps

- Four pumps at full build-out, each with maximum sound level of 74 dB(A) at 3 feet (add 6 dB to adjust for multiple sources = 80 dB(A)).
- Nearest residence approximately 1,190 feet to the west.

The noise at the nearest residence is calculated using the inverse square law:

$SPL2 = SPL1 - 20 * \text{Log}(D2/D1)$

Where:

SPL1 = known sound pressure level (noise) at a given distance (dB(A))
SPL2 = sound pressure level (noise) at the nearest residence (dB(A))
D1 = distance (feet) for the known noise level (SPL1)
D2 = distance (feet) to the nearest residence

Therefore, if twenty 75-hp aerators were used for the wastewater treatment plant, the noise would be approximately 31 dB(A) at the nearest residence during the summer. This noise level is not expected to be heard over background noise (which is assumed to be 44 dB(A)) With the aerators operating for 24 hours per day, there would be a slight increase in Ldn (expected to be less than 1 dB(A)) at the nearest residence, but it would not cause an adverse impact.

In the winter, the noise would be approximately 36 dB(A) at the nearest residence. This noise level also is not expected to be noticeable over background levels.

If fifteen 100-hp aerators were used, the noise in the summer would be approximately 29 dB(A) at the nearest residence, while the noise in the winter would be approximately 34 dB(A). These noise levels are not expected to be heard over background levels. With the aerators operating for 24 hours per day, there would be a slight increase in Ldn (expected to be less than 1 dB(A)) at the nearest residence, but it would not cause an adverse impact.

The noise from the four intake pumps, located within the intake structure near the shoreline, would be approximately 28 dB(A) at the nearest residence, which is not expected to be heard over background noise. Even if these pumps operated 24 hours per day, the Ldn at the nearest residence would not be expected to increase above the current estimated background level of 44 dB(A).

In conclusion, the noise from the aerators (whether twenty 75-hp or fifteen 100-hp aerators are used) and the noise from the intake structure pumps is not expected to result in significant noise exposures for nearby residents.

The impact of operational noise levels generated by the proposed tissue mill can also be evaluated using available information on perceived sound levels from a similar tissue mill. That mill operates within a residential area and adjacent to an elementary school without receiving complaints from its neighbors about the noise levels. The proposed tissue mill, which would be located farther from residences than the similar mill, is not expected to generate noise levels that would have an adverse impact on the surrounding area.

Transportation noise generated by the tissue mill, including auto, truck, and rail traffic, would be the primary source of noise impacts on the local community.

Truck traffic would be the major contributor to transportation noise. Approximately 52 truck trips would be generated each day for Phase I and 306 truck trips each day at build-out. Most truck traffic is expected to occur during daylight hours, with at least 50% during the day shift. The expected increase over the ambient noise level may have a moderate impact on some individuals, in particular the residents living near the entrance road to the Barton Industrial Park). However, the highest noise levels would occur during the day when many residents are away from home.

According to projections, rail shipments would occur daily with 7 to 9 railcars per shipment. Noise from rail traffic is expected to have a low level of impact on nearby residents because of the timing of shipments (avoiding "rush hour" traffic and late night) and the small train length.

4.12 Effects on Archeological/Historical Resources

There are no sites in the project area that are included in, or are eligible for, the National Register of Historic Places (see Section 3.12). Therefore, construction and operation of the proposed tissue mill and the proposed entrance road and railroad spur would have no effects on archeological or historical resources. However, the Gilbert House and the cemetery that are located near the proposed Barton Industrial Park entrance road (Figure 3.5-1) would be avoided during construction activities.

The Gilbert House is owned by SEDA. Its status for eligibility on the Historical Register is undetermined because the age of this house is currently uncertain. Nevertheless, the entrance road development plans would employ measures to avoid impacts to the Gilbert House. Thus, this potential historical resource would not be affected by the entrance road construction or operation. Cemeteries are protected by state law; and construction management plans would be developed to avoid any impacts to the cemetery shown on Figure 3.5-1. Thus, this cemetery would not be affected by the proposed mill or entrance road construction and operation. TVA would review and approve the development plans for the entrance road and the construction management plan.

4.13 Effects on Aesthetics/Visual Quality

Construction activity, in particular the large cranes, would be visible from the Tennessee River as well as from the land across the river. Local residents may have a view of the construction activities, depending upon their elevation and whether there are any tall trees in their line of sight. Most of the residences in the area are over one-third mile from the site area to be developed and any view they have of the construction activities would be from a distance. Any visual impact during construction would be temporary. Construction activities such as earth moving operations would generate dust that may be perceivable off-site. Exhaust from construction equipment would produce some smoke and odor, which is expected to be confined to the site. Control measures such as watering and revegetation of bare areas would be carried out as practicable to minimize fugitive dust.

The proposed tissue mill is expected to alter scenic values in the area, including the views from across the Tennessee River. The facility buildings would range from 25 to 60 feet in height (from ground surface), with one portion of the finish goods warehouse potentially 90 feet in height. The stack heights range from 52 feet (boiler) to 75 feet (paper machine building). Most of the residences in the area are at least one-third mile from the proposed tissue mill location and, if they have a view of the facility not obscured by intervening woodlands, it would be at a distance. The facility would be approximately 1,500 feet from the river bank. At normal water levels, boaters on the river would most likely not have a view of the facility, considering the distance and the tall trees in the shoreline areas. Landscaping and the buffer provided by existing woodlands would reduce the visual impact of the facility.

Boaters and other lake users, however, would have a view of the water intake structure located along the river shoreline. The structure consists of a 45 x 20 foot rectangular raw water intake pump station/wet well to be located about 50 to 75 linear feet from the normal pool elevation of 414 feet msl. The wet well structure would be below grade with the top at 428 feet msl. A small above ground building, approximately 10 feet high, would be associated with the intake structure. The building façade would be complementary in color to the existing shoreline to avoid creating a focal point. The intake/outfall pipeline corridor would be approximately 75 feet wide along the shoreline. The corridor would be replanted with native plants and the portion below the 100-year flood elevation would be stabilized with rip rap supplemented with native vegetation (e.g., black willow and coral-berry). The use of native vegetation plantings would reduce the visual impact of the pipeline corridor.

Effluent from the mill is not expected to produce foam on the surface of the Tennessee River. The discharge structure would include a foam trap. Light from the tissue mill buildings and support facilities would be visible at night to nearby residents. However, the distance of most of the residences from the facility and the presence of the intervening woodlands would limit the potential visual impact of facility lighting on humans and wildlife. In addition, all area floodlighting, roadway lighting and building or structure perimeter illumination would use lighting fixtures with cut-off optics, shielding, and beam control optics, or similar features, to optimize light utilization and minimize spill light and glare. Along the Tennessee River, the discharge structure would have no lighting and the intake structure would be illuminated by a halogen “street light” fixture at the small building associated with it. This lighting would not be activated except during operation and maintenance to the structure.

Based on the limited views of most of the facility from offsite locations, the presence of other industrial facilities in the area, the episodic nature of construction activities, the use of complementary colors, landscaping, and limited lighting, TVA expects that the effects of the mill on visual and aesthetic quality would be insignificant

4.13 Indirect and Cumulative Effects

4.13.1 Indirect Impacts

Land Use--The proposed tissue mill would have a small indirect impact on land use in the surrounding area. Introduction of the new large industrial facility would increase awareness of the Barton Riverport Industrial Park and lead toward development of the park sooner than would otherwise occur. The additional traffic would tend to encourage development of additional highway service facilities such as fuel stations and restaurants. Exactly where, when, or how much development would depend on many factors and is not reasonably foreseeable. However, TVA expects that it would be small and not significant.

Economic Effects--Indirect socioeconomic impacts would be a likely effect of the proposed mill. Studies have shown that 1.4 ancillary jobs are typically created for every new manufacturing job. With employment for the full build-out of the mill approximately 675 workers, this multiplier would result in an additional 945 new jobs for the local economy (Earth Tech, 2002—the Preliminary DEA).

Incomes would also be multiplied. The business community sometimes uses a wage multiplier of 1.7 to account for the additional economic impact on the community resulting from new wages. With an annual payroll of approximately $22 million at the end of Phase IV there would a total positive impact of $37 million annually to the area economy. (The anticipated total payroll in phase six phases is not yet determined.) The spending of additional income generated by the proposed tissue mill would yield extra tax revenue for local and regional governments (Earth Tech, 2002—the Preliminary DEA).

Though these economic impacts would be beneficial to the community, they would be small in comparison with the size of the area's economy. Therefore, TVA expects that they would not be significant.

4.13.2- Cumulative Impacts

The discharge of the proposed mill would have a small cumulative impact on water quality. In addition to the existing discharges, the increases in nutrients would contribute to high chlorophyll levels. However, the contribution would be small and TVA considers that it would be insignificant.

4.14 Unavoidable Adverse Environmental Effects

The construction and operation of the proposed tissue mill would result in certain adverse effects that are unavoidable. These effects are largely inevitable and are described in detail in the preceding sections of this EA. Although these effects are mitigated by measures described in the preceding sections, the Proposed Action would result in some level of adverse impact primarily on surface water quality, land use, air quality, aquatic biota, and noise. None of these adverse impacts are considered to be significant.

4.15 Relationship Between Short-Term Uses and Long-Term Productivity

The current land use of the project property is agricultural production. If TVA and USACE did not provide the requested approvals and the mill were not constructed the property could continue in agriculture, but given the local community's intent to use the property for industry, agriculture would likely be a short-term use. The construction of the proposed tissue mill is expected to result in long-term use of the property for industrial production of paper products. This would enhance the long-term productivity of the local community and economy. Use of waste paper as a feedstock instead of disposing of it would also enhance the long-term productivity of natural resources.

4.16 Irreversible and Irretrievable Commitment of Resources

Irreversible resource commitments are those that essentially cannot be reversed, such as the consumption of fossil fuels. Irretrievable resource commitments are those that are lost for a period of time, but that may be recovered over the long term, such as the clearing of forest to convert land to agriculture. The fuel, energy and materials that would be used to construct and operate the proposed facility and to transport workers and supplies would be irreversibly lost. The use of the project property for the proposed paper manufacturing facility would be an irretrievable loss of the site for agricultural or other uses. Additionally, the physical changes to

the project property would result in the irretrievable loss of relatively small areas of native ecological habitats through the conversion of woodlands along the property perimeter to facility structures or maintained facility grounds (e.g., lawns). Using waste paper as feedstock would be a reduction from the irreversible and irretrievable commitment of resources to manufacture paper from wood.

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5.0 MEASURES TO MITIGATE ADVERSE IMPACTS

The proposed mill would incorporate a number of features to minimize adverse impacts. Many of these would be inherent aspects of the design as proposed. Others would be required by state and federal permits, generally as routine measures. These are discussed as applicable in other sections of the EA as explanations for TVA's determination that particular impacts are expected to be insignificant. They would need no special commitment to ensure that they would be adopted. Some mitigation measures would go beyond these inherent, routine, or legally required measures. These would be special requirements for TVA approval and would need individual documentation as commitments by Southeast Tissue, TVA, or USACE. Though discussed in the applicable other sections of the EA, they are compiled in this section for reference.

- To minimize the impacts to the populations of Dutchman's breeches and Enemion, TVA would require that the engineering firm designing the intake and outfall lines prepare a construction plan for the lines to be located as far to the west within the ravine as feasible given the presence of rock bluffs, moving the corridor itself if necessary. Within the ultimately selected corridor, clearing would be minimized to minimize increase of sunlight and soil compaction. If the lines could not be moved far enough west to avoid all the Dutchman's breeches plants the engineering firm would develop and implement a transplantation and monitoring plan. TVA would review and approve the construction and monitoring plans.

- TVA would require that the engineering firm designing the access road prepare a road development plan including measures to protect the Gilbert House. TVA would review and approve the protective measures.

- TVA would require that the engineer in charge of construction of the mill facilities prepare a construction management plan including measures to protect the cemetery south of the site of the proposed mill. TVA would review and approve the protective measures.

- TVA would require that Southeast Tissue provide for the façade of the building associated with the intake structure to be complementary in color to the existing shoreline to avoid creating a focal point

- TVA would require that Southeast Tissue provide for all area floodlighting, roadway lighting and building or structure perimeter illumination to use lighting fixtures with cut-off optics, shielding, and beam control optics, or similar features, to optimize light utilization and minimize spill light and glare. Along the Tennessee River, the discharge structure would have no lighting and the intake structure would be illuminated by a halogen “street light” fixture at the small building associated with it. This lighting would not be activated except during operation and maintenance to the structure.

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6.0 CONSULTATION AND COORDINATION

6.1 Land and Cooperating Agencies

TVA is the agency with the majority of actions necessary for the proposed mill to be constructed, and the scope of the TVA involvement federalizes the entire mill proposal. Therefore, TVA is the lead agency in preparation of this EA. USACE is a cooperating agency because their actions would not federalize the entire mill proposal. No other agencies requested or were invited to be cooperating agencies.

6.2 Intergovernmental Review

On January 28, 2002, TVA initiated intergovernmental review of the proposed federal actions, inviting comment on the issues that needed to be addressed. The following agencies were contacted:

U.S. Department of the Interior, including the:

U.S. Fish and Wildlife Service

Natchez Trace Parkway

Office of Environmental Policy and Compliance

U.S. Environmental Protection Agency

Alabama Department of Conservation and Natural Resources

Alabama Department of Environmental Management

Alabama Historical Commission

Alabama Indian Affairs Commission

Northwest Alabama Council of Local Governments

Continuing intergovernmental review, this draft EA is being sent to those same agencies, along with the local governments of:

Colbert County

Lauderdale County

Florence

Sheffield

Muscle Shoals

Cherokee

Barton

Shoals Economic Development Authority

Sheffield Utilities

Shoals Chamber of Commerce, Inc.

Alabama Department of Transportation

Alabama Department of Economic and Community Affairs

6.3 Public Review and Comment

A notice of availability of the EA has been placed in the Colbert County Reporter on Friday, June 07, 2002, and in the Florence Times-Daily on Sunday, June 9, 2002 inviting the public to comment by July 7, 2002. Copies have been provided to the Florence-Lauderdale Public Library the Muscle Shoals Public Library,; and the Cherokee Public Library and were made available at the TVA Pickwick Watershed Team office at SB 1H, Muscle Shoals. In addition, a copy has been sent to Mr. Goodloe Pride, a resident of Florence who has requested one. The draft EA has been posted on TVA's website at http://www.tva.gov/environment/reports. Comments will be addressed in the final EA .

TABLE OF CONTENTS

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Replacement 06-24-2002

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Replacement 06-24-2002

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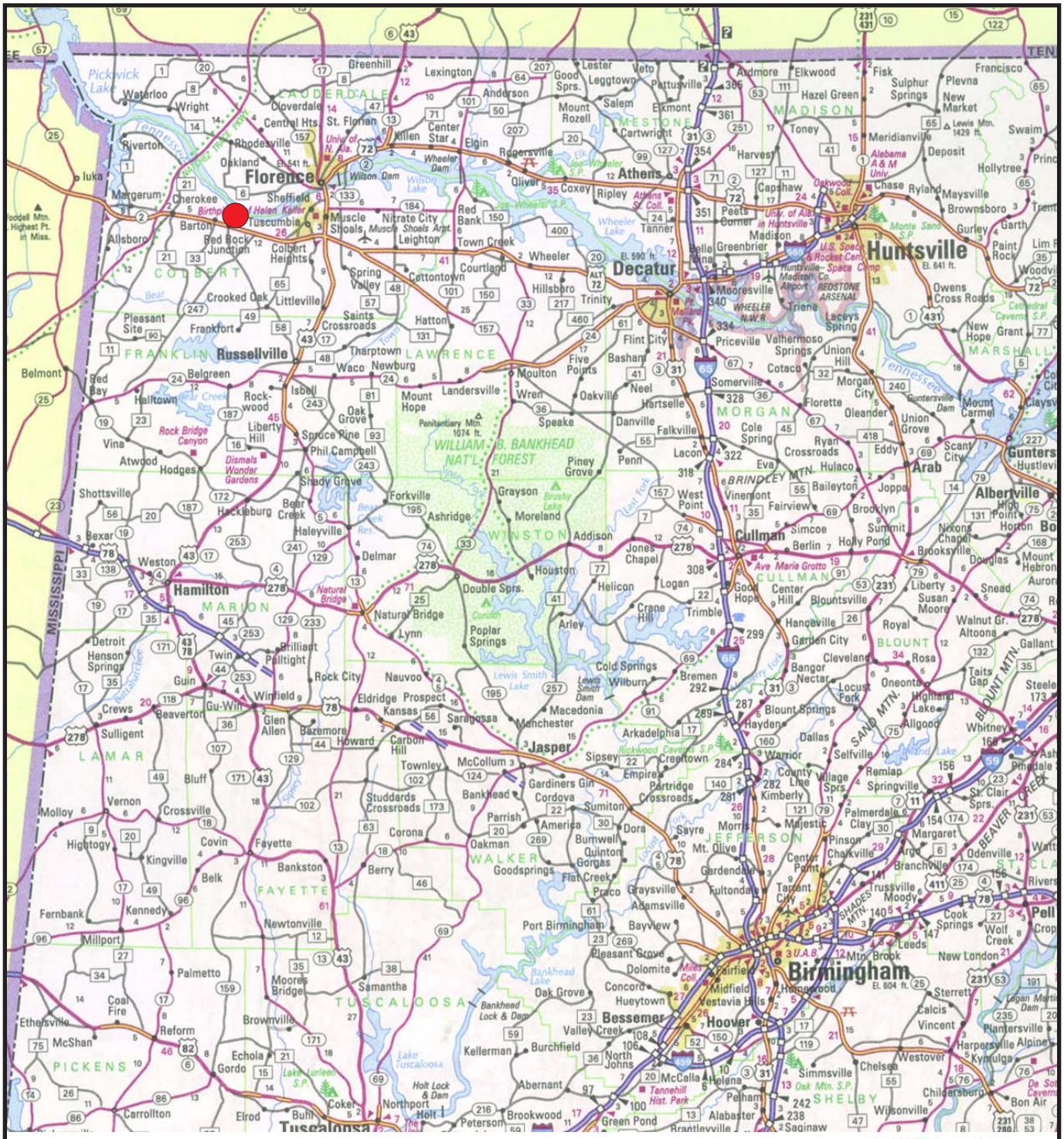
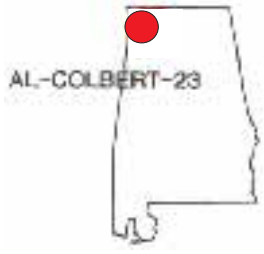




EARTH TECH

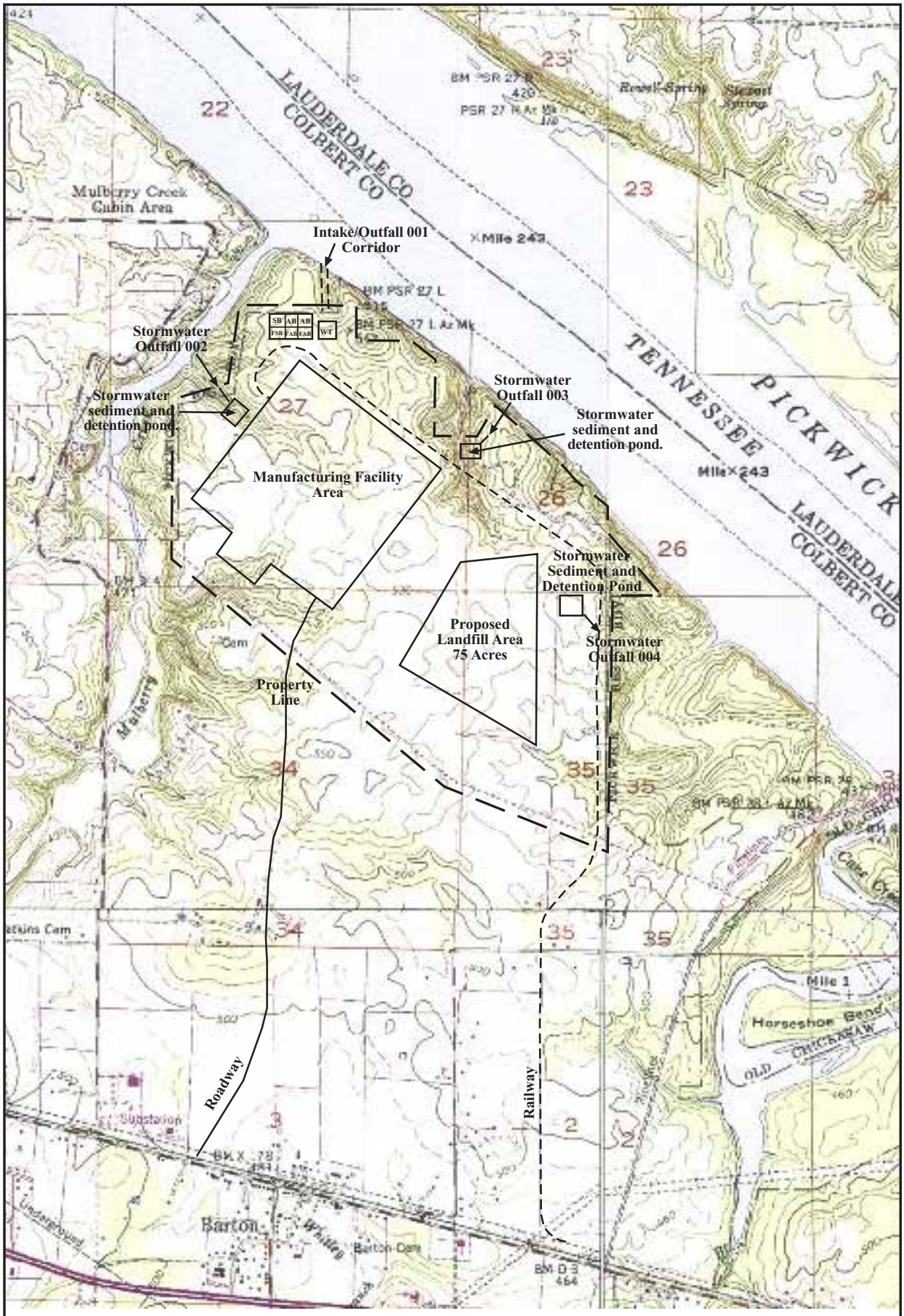
A tyco INTERNATIONAL LTD. COMPANY

Figure 1.1-1

Site Location Map

Southeast Tissue Company, LLC.
Proposed Barton Alabama Facility
Earth Tech Project No. 51840

51840/CADD/ f_1.1-1sitelocmap.fh9



SB = Sedimentation Basin
AB = Aeration Basin
FAB = Future Aeration Basin
FSB = Future Sedimentation Basin
WT = Water Treatment

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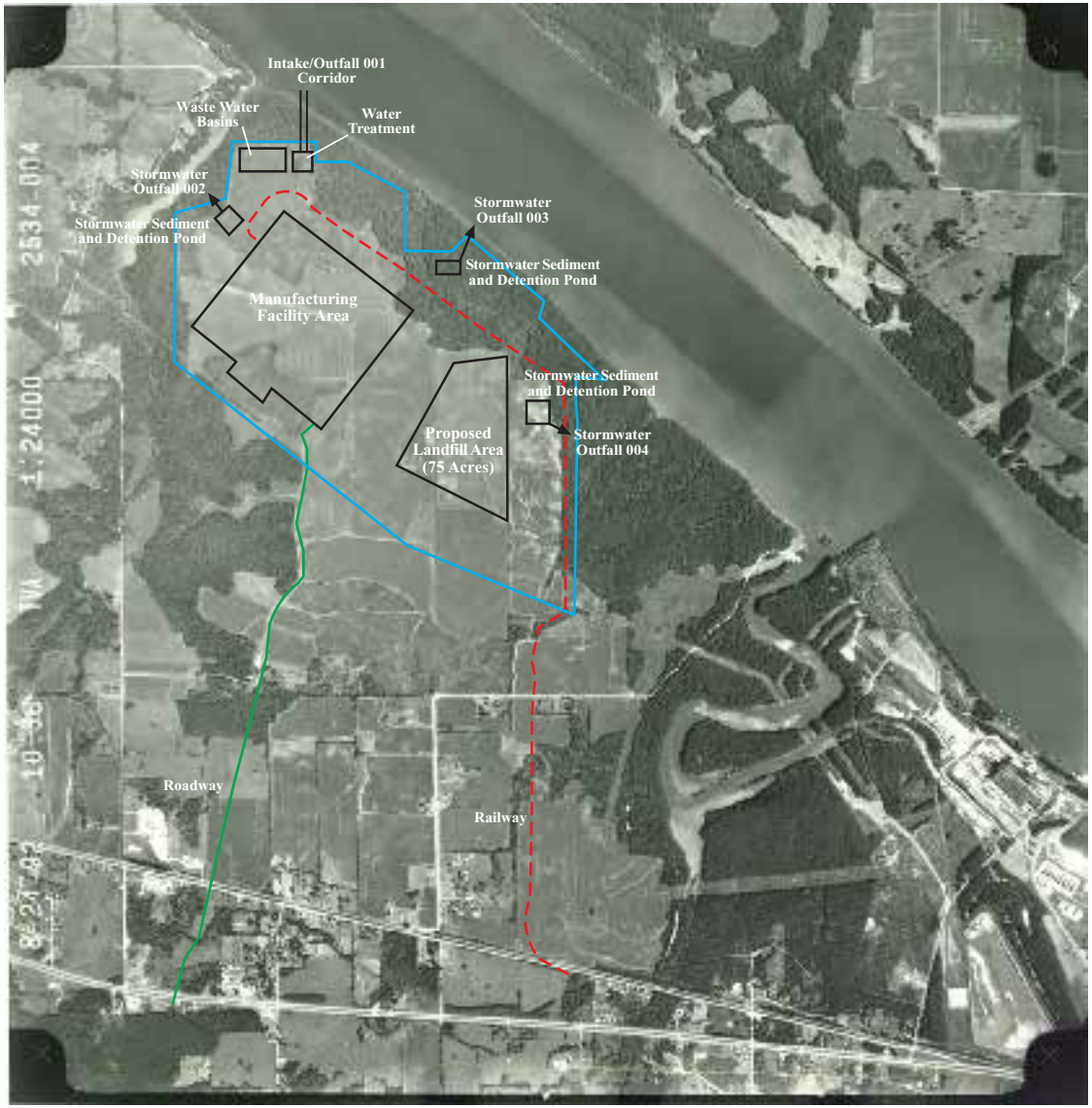
Figure 1.1-2
General Layout Drawing

Proposed Barton, Alabama Facility
Southeast Tissue Company LLC

Project No. 51840 January 2002

Fig. 1.1-2-genLayout southeast tiss. 51840



Legend

- Entrance Roadway
- Approximate Property Line
- Railway
- Intake/Outfall 001 Corridor
- Various Components

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Figure 1.1-3
Aerial Photograph
Showing General Layout
(Date of photo August 1992)

Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 February 2002

51840/ F_1.1-3wastewBasins.fh9

INTAKE / OUTFALL #001
CORRIDOR

TENNESSEE RIVER

STORMWATER
SEDIMENT AND
DETENTION POND

PROPERTY BOUNDARY

EDGE OF WATER
CONTOUR

PROPOSED
LANDFILL
AREA
75 AC

STORMWATER
SEDIMENT AND
DETENTION POND

MULBERRY CREEK

STORMWATER
SEDIMENT AND
DETENTION POND

0' 350' 700'
SCALE

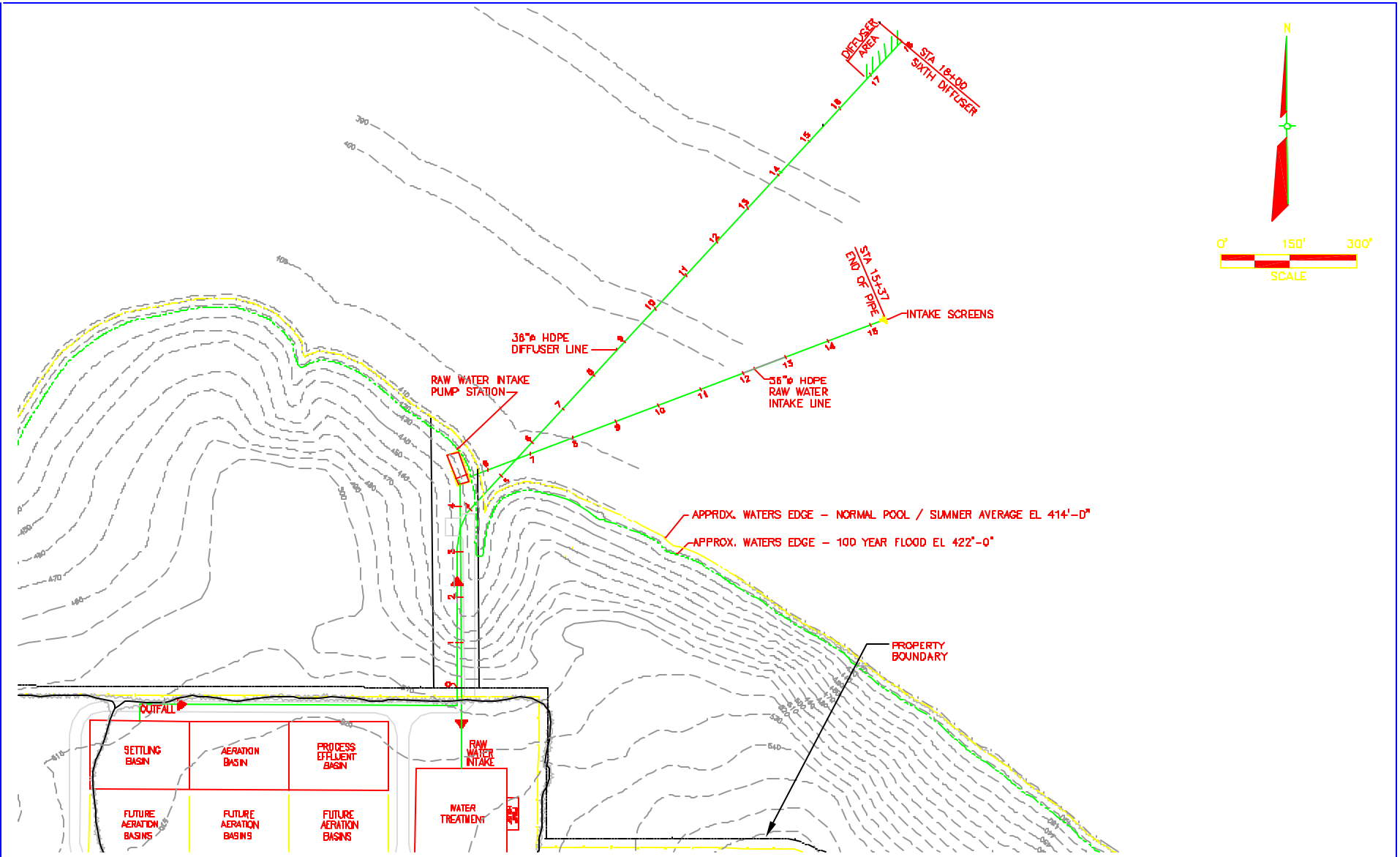
51840\Fig1.1-4.DWG LOT DATE: 04\26\2002

EARTH TECH

Figure 1.1-4
Facility Detailed Layout

Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002

51840\FIG2.1-1.DWG PLOT DATE: 04\26\2002

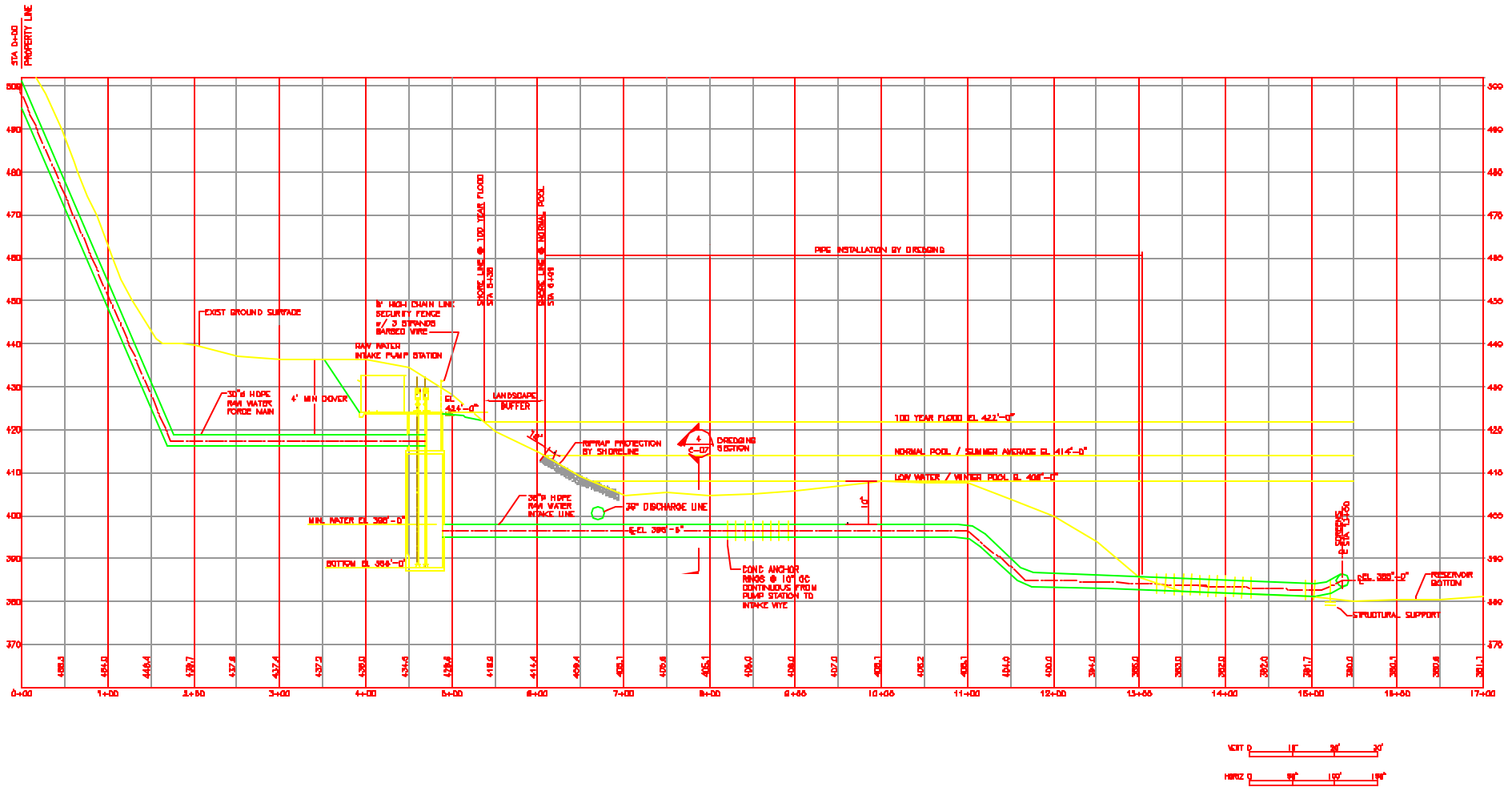


EARTH TECH

Figure 2.1-1

Raw Water Intake
And Discharge Lines
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002

51840\FIG2.1-2.DWG PLOT DATE: 04\25/2002



EARTH TECH

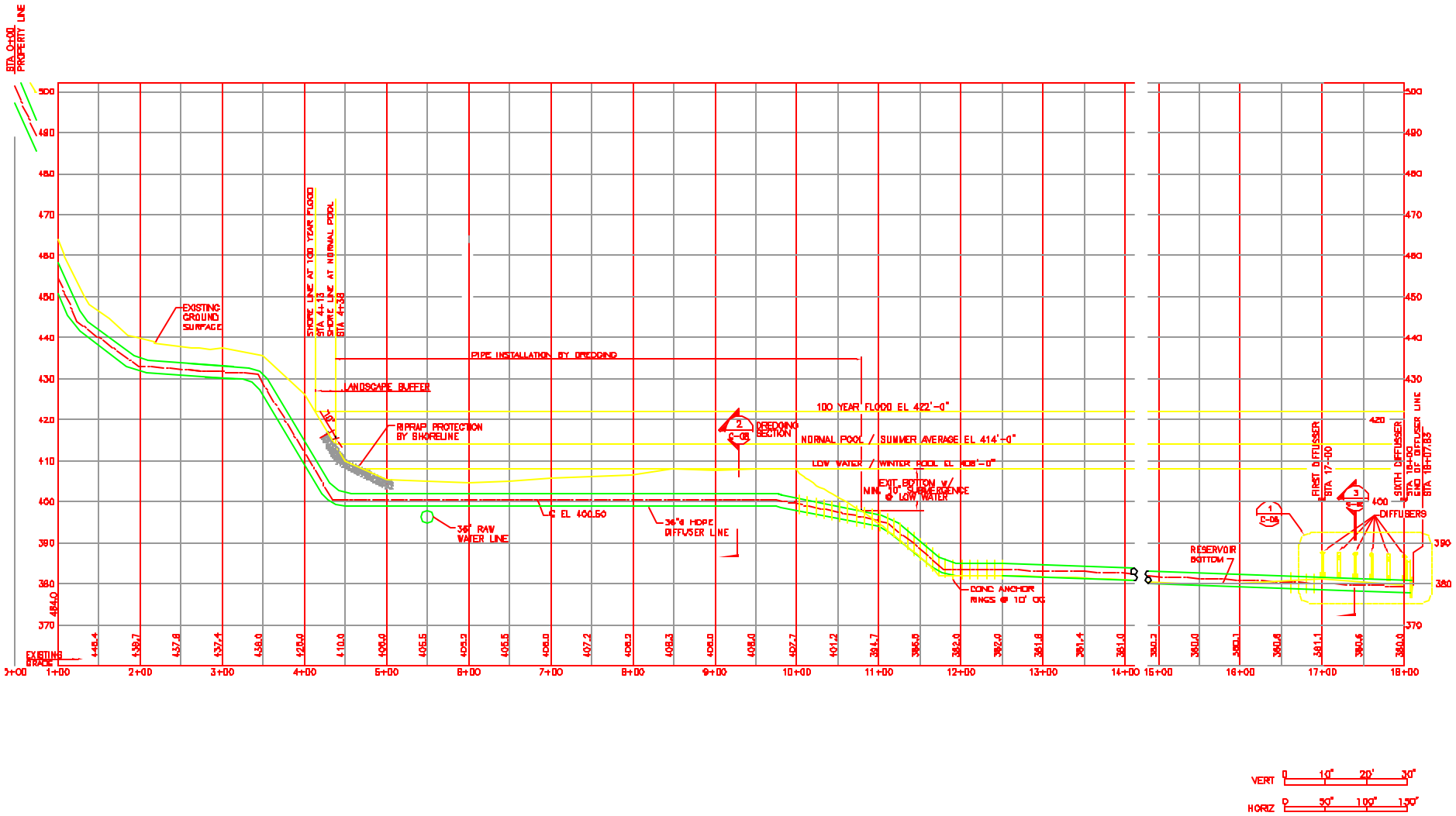
Figure 2.1-2

Profile

Raw Water Intake Line

Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002

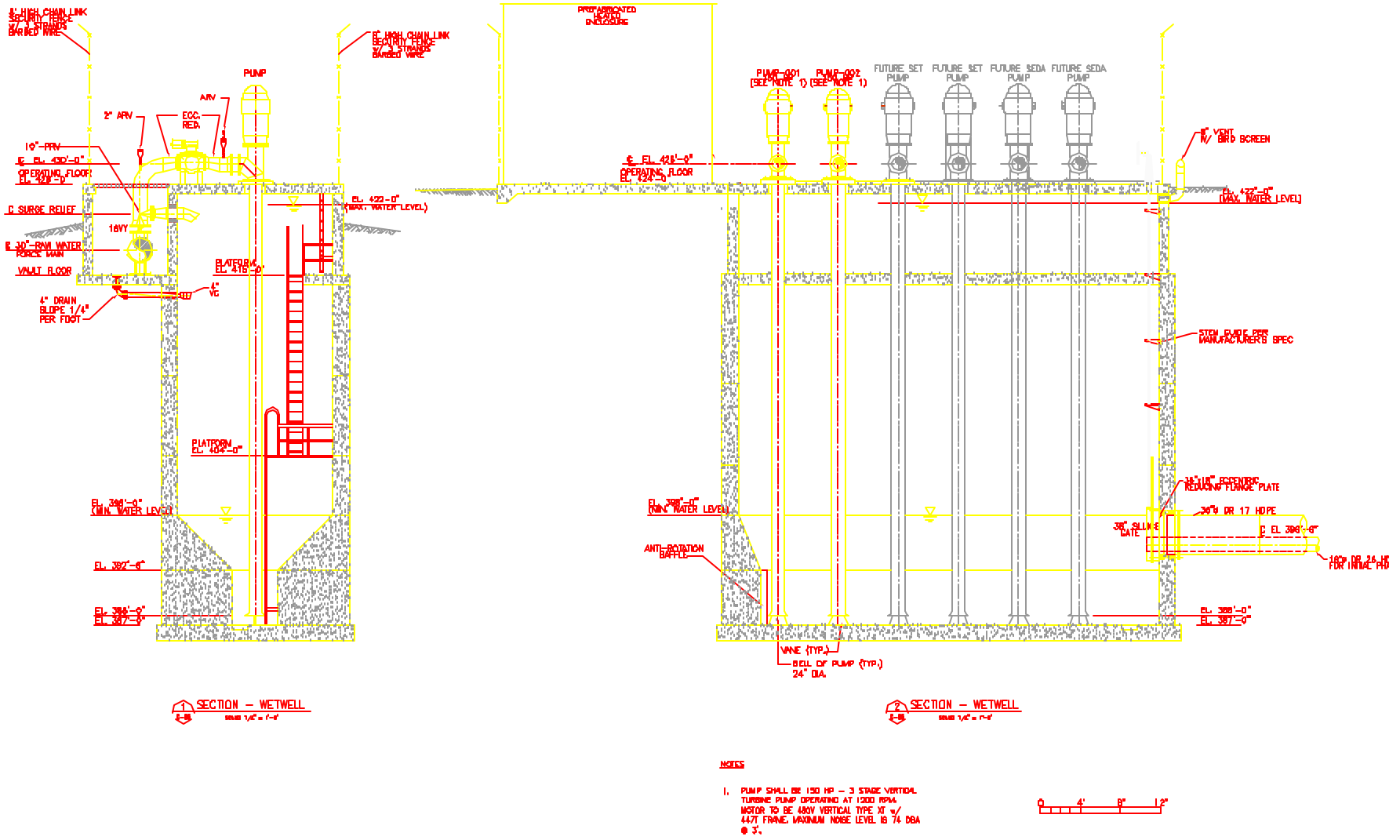
51840\FIG2.1-3.DWG PLOT DATE: 04\26\2002



EARTH TECH

Figure 2.1-3
Profile
Discharge Line
Southeast Tissue Company LLC
Proposed Berton, Alabama Facility
Earth Tech Project No. 51840 April 2002

51840\FIG2.1-4.DWG PLOT DATE: 04\26\2002



1 SECTION – WETWELL
SCALE 1/4" = 1'-0"

2 SECTION – WETWELL
SCALE 1/4" = 1'-0"

NOTES

1. PUMP SHALL BE 150 HP – 3 STAGE VERTICAL TURBINE PUMP OPERATING AT 1200 RPM. MOTOR TO BE 480V VERTICAL TYPE XT w/ 447T FRAME. MAXIMUM NOISE LEVEL IS 74 DBA @ 3'.

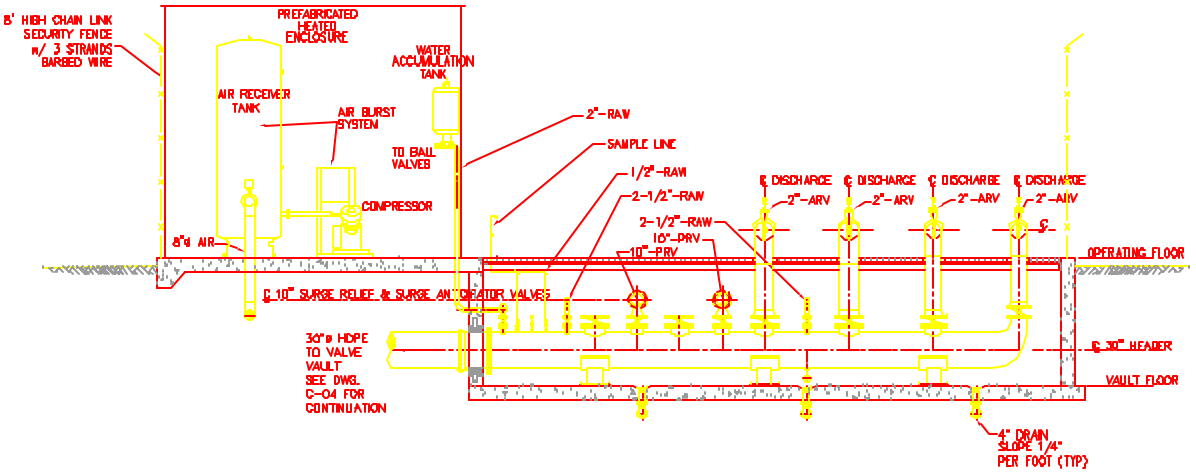
0 4' 8' 12"

EARTH TECH

Figure 2.1-4
Raw Water Intake
Wetwell Sections

Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002

51840\FIG2.1-5.DWG PLOT DATE: 04\26\2002

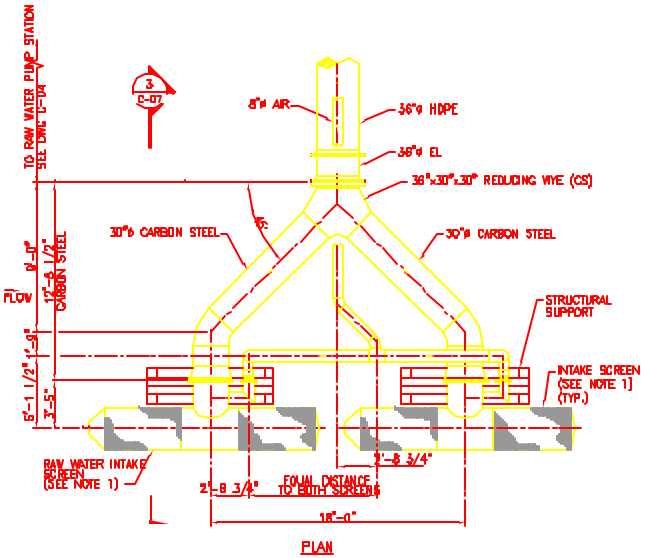


1 C-07 SECTION – PUMP STATION

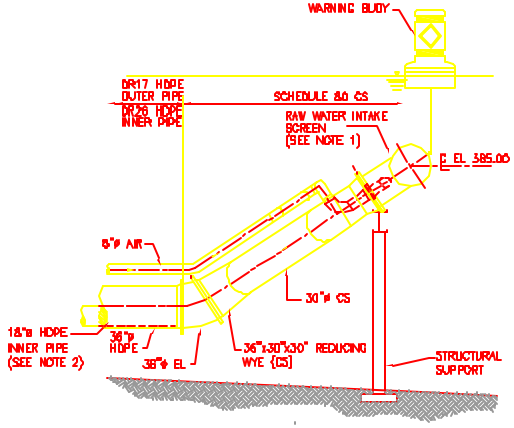
NOTES

1. EACH SCREEN WILL BE 42"ø w/ 70" SCREEN LENGTH (TOTAL PER SCREEN). SCREEN OPENING WILL BE 1/8".
2. IN ORDER TO MAINTAIN MIN. 2 FPS VELOCITY IN INTAKE LINE DURING INITIAL PHASES, AN 18"ø HDPE LINE WILL BE INSTALLED INSIDE OF THE 30" ø MAIN LINE. THIS PIPE WILL BE REMOVED WHEN FLOWS EXCEED 6 MGD.

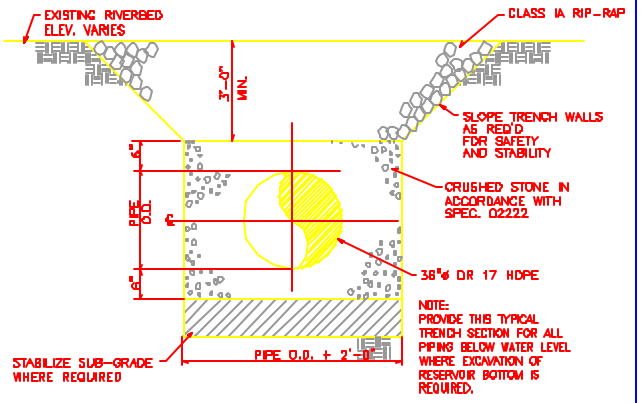
0 4' 8' 12'



2 C-07 DETAIL – RAW WATER INTAKE



3 C-07 SECTION – RAW WATER INTAKE

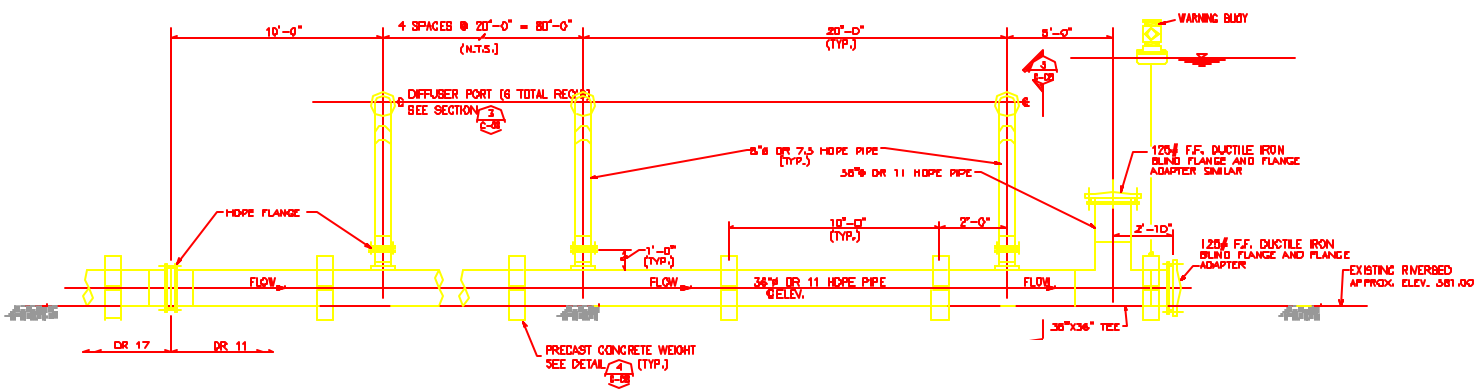


4 C-07 DREDGING SECTION

EARTH TECH

Figure 2.1-5
Raw Water Intake
Pump Building Sections & Details
Southeast Tissue Company LLC
Proposed Burton, Alabama Facility
Earth Tech Project No. 51840 April 2002

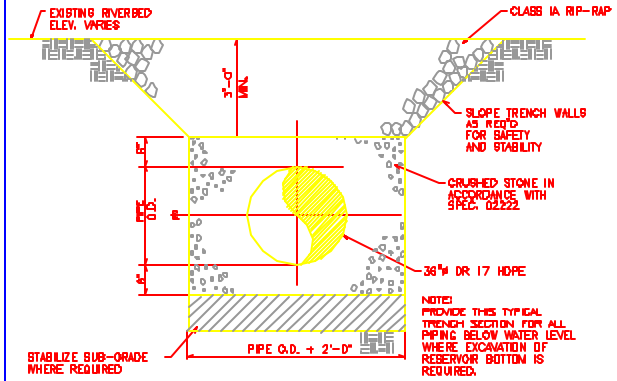
51840\FIG2.1-6.DWG PLOT DATE: 04\26\2002



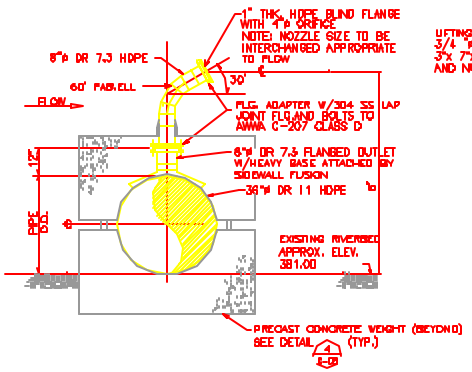
1 DETAIL
C-05
SCALE: NONE

NOTES

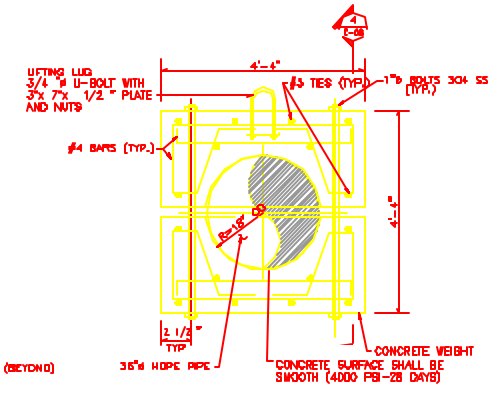
1. WHERE REQUIRED, CONTRACTOR SHALL DREDGE TRENCH IN RIVER BOTTOM AND REMOVE ALL SPOIL MATERIAL TO A LEGAL DISPOSAL AREA.
2. DIFFUSER SECTION AND PIPING SHALL BE PRESSURE TESTED PRIOR TO INSTALLING BELOW WATER LINE.
3. U.S. ARMY C.O.E./T.V.A. SHALL BE NOTIFIED TWO WEEKS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE RIVER. RIVER NAVIGATION MUST BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL PROVIDE ALL WARNING MARKERS, BARRICADES AS MAY BE REQUIRED BY THE C.O.E./T.V.A.
4. ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND PERMIT REQUIREMENTS MUST BE COMPLIED WITH AT ALL TIMES.
5. ALL INFORMATION SHOWN IS PRELIMINARY, BASED ON AVAILABLE INFORMATION. FINAL CONFIGURATION WILL BE BASED ON WATER QUALITY MODEL.



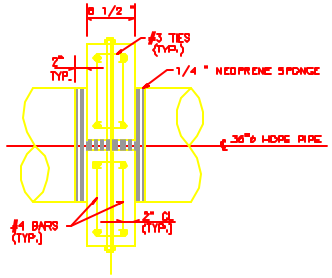
2 DREDGING SECTION
C-08
SCALE: NONE



3 SECTION – DIFFUSER PORT
C-08
SCALE: NONE



4 SECTION – CONCRETE WEIGHTS
C-08
SCALE: NONE



5 SECTION – CONCRETE WEIGHTS
C-08
SCALE: NONE

EARTH TECH

Figure 2.1-6
Diffuser
Sections And Details
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002

Phase V Addition

Future Aerated Stabilization Basin No. 3
Volume = 16,500,000

Phase VI Addition

Future Aerated Stabilization Basin No. 4
Volume = 16,500,000

Phase V & VI Addition

Future Settling Basin
Volume = 12,000,000

Chemical Feed Pump

Defoamer Tote/Drum

Chemical Feed Pump

Aqua Ammonia Tank

Process Wastewater From Mill, Utility Wastewater, Landfill Leachate and Stormwater

Chemical Feed Pump

Flow Monitoring Station 1

Phosphoric Acid

Aerated Stabilization Basin No. 1
Volume = 16,500,000 GAL

Phase I - III HRT = 5 Days
Phase IV HRT = 3 Days

Aerated Stabilization Basin No. 2
Volume = 16,500,000 GAL

Phase I - III HRT = 5 Days
Phase IV HRT = 3 Days

Phase I - III Flow = 3.3 MGD
Phase IV Flow = 5.5 MGD

Surface Aerators
(75 HP Each)

Surface Aerators
(75 HP Each)

Settling Basin
Volume = 12,000,000
Phase I-III HRT = 3.6 Days
Phase IV HRT = 2.2 Days

Sanitary Wastewater

Phase I - VI Flow = 0.035 MGD

Pump Station

Pump

To Town of Cherokee Publicly Owned Treatment Works

Flow Monitoring Station II (NPDES Monitoring Point)

Phase I-III Flow = 3.3 MGD
Phase IV Flow = 5.5 MGD
Phase V Flow = 8.8 MGD
Phase III Flow = 11 MGD

Outfall 001

Tennessee River

Phase I Converting Wastewater (Temporary)

Phase I Flow = 0.030 MGD

Phases I - IV Structures and Equipment

Phases V & VI Additions

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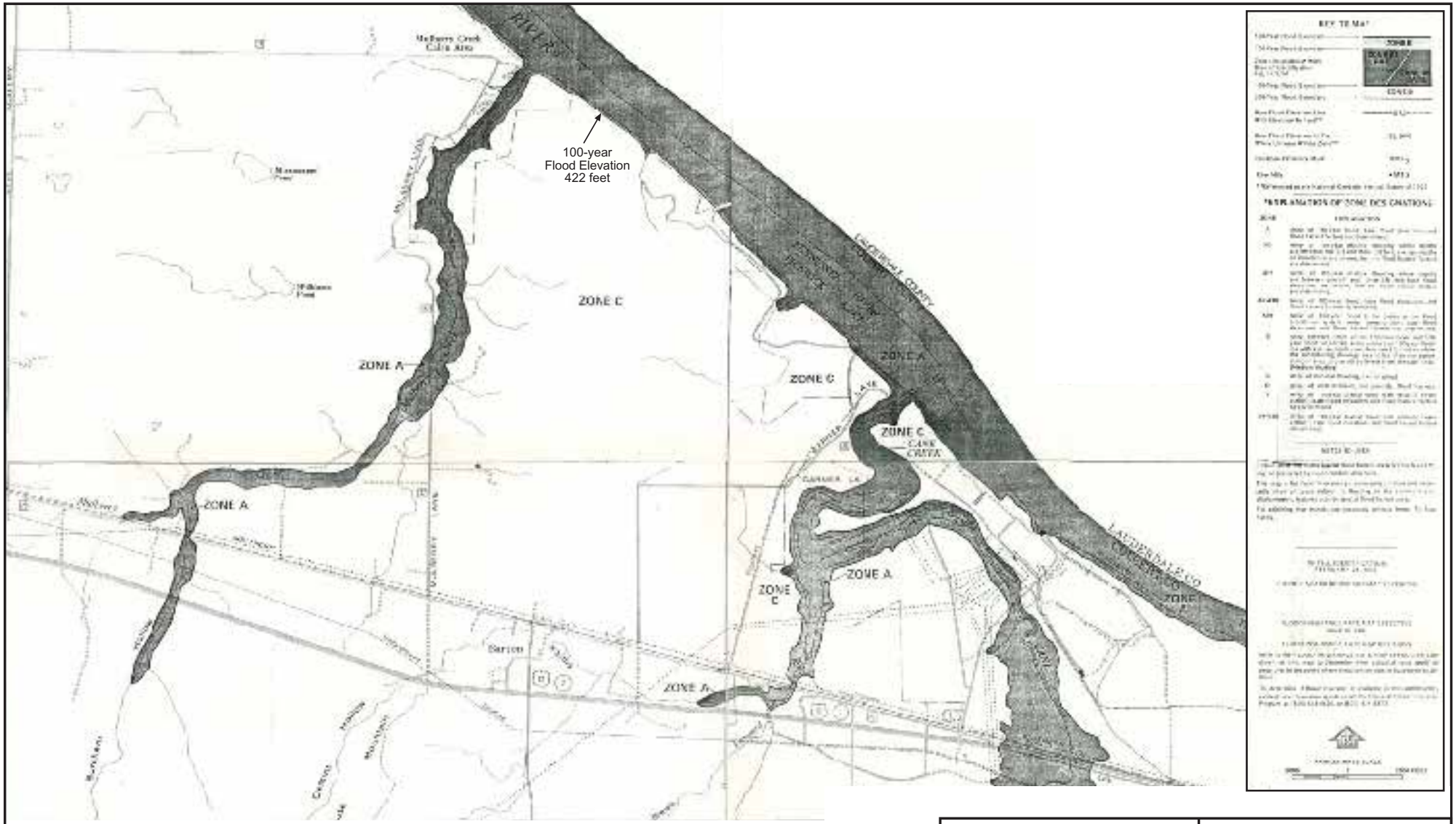
Figure 1.7-7

Proposed Process Flow Diagram
Wastewater Treatment Facility
Southeast Tissue Company LLC

Proposed Barton, Alabama Facility

Earth Tech Project No. 51840 January 2002

work/cadd/51840/F_1.7-7NPDES Permit.fh9



Source: Composite of Flood Insurance Rate Map Panels, 250 of 500; 225 of 500; 75 of 500; June 15, 1981.

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A tyco INTERNATIONAL LTD. COMPANY

Figure 3.1-1
Site Vicinity 100-Year Flood Plain

Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 February 2002

51840/ F_Table 100yr plain.fh9

INTAKE / OUTFALL #001 CORRIDOR

TENNESSEE RIVER

STORMWATER SEDIMENT AND DETENTION POND

PROPERTY BOUNDARY

WETLAND BOUNDARY ELEVATION 414

EDGE OF WATER CONTOUR

N

MULBERRY CREEK

STORMWATER SEDIMENT AND DETENTION POND

PROPOSED LANDFILL AREA 75 AC

STORMWATER SEDIMENT AND DETENTION POND

WETLAND AREA

0' 350' 700'

SCALE

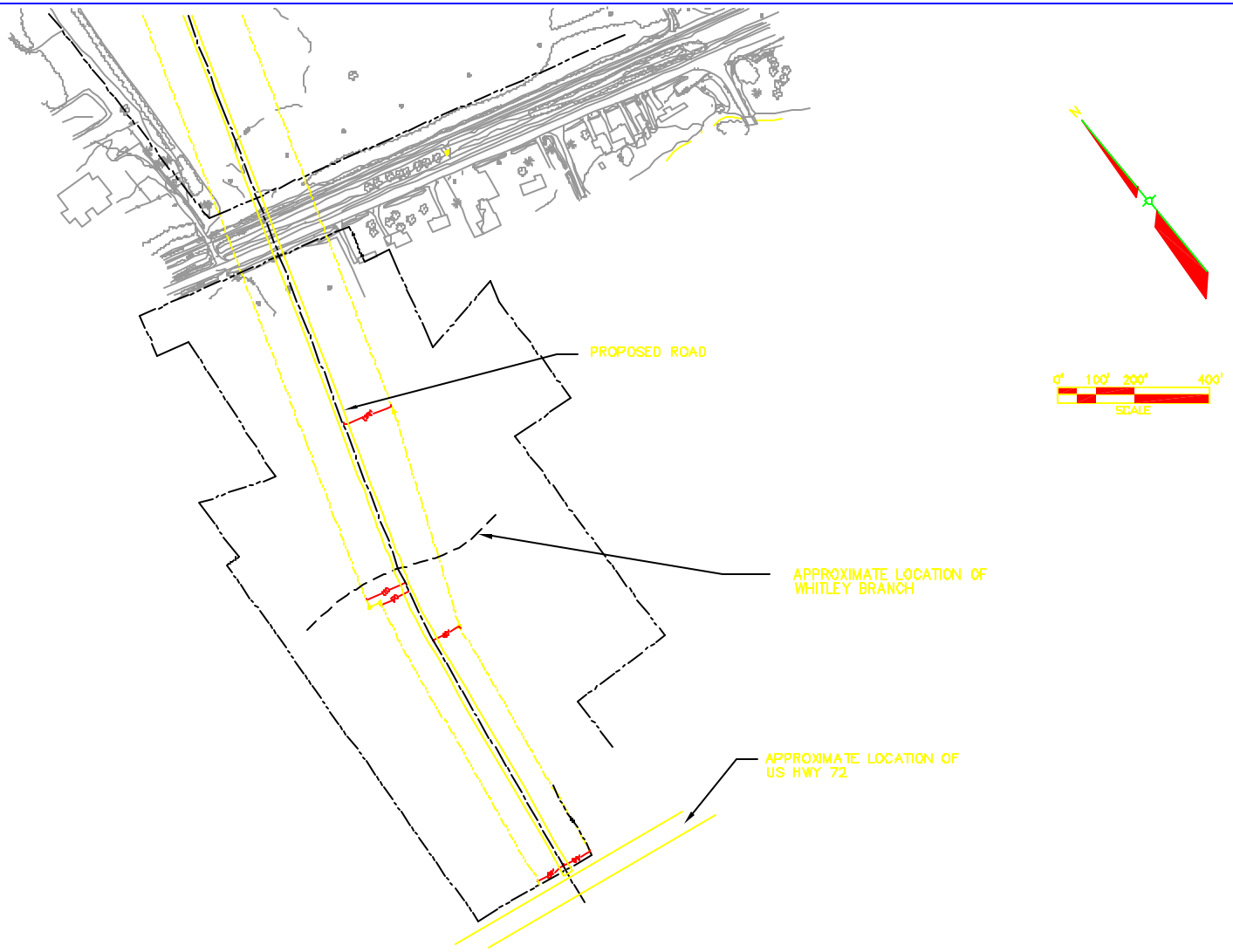
51840\FIG3.1-2.DWG PLOT DATE: 02\14\2002

EARTH TECH

Figure 3.1-2
Wetland Areas

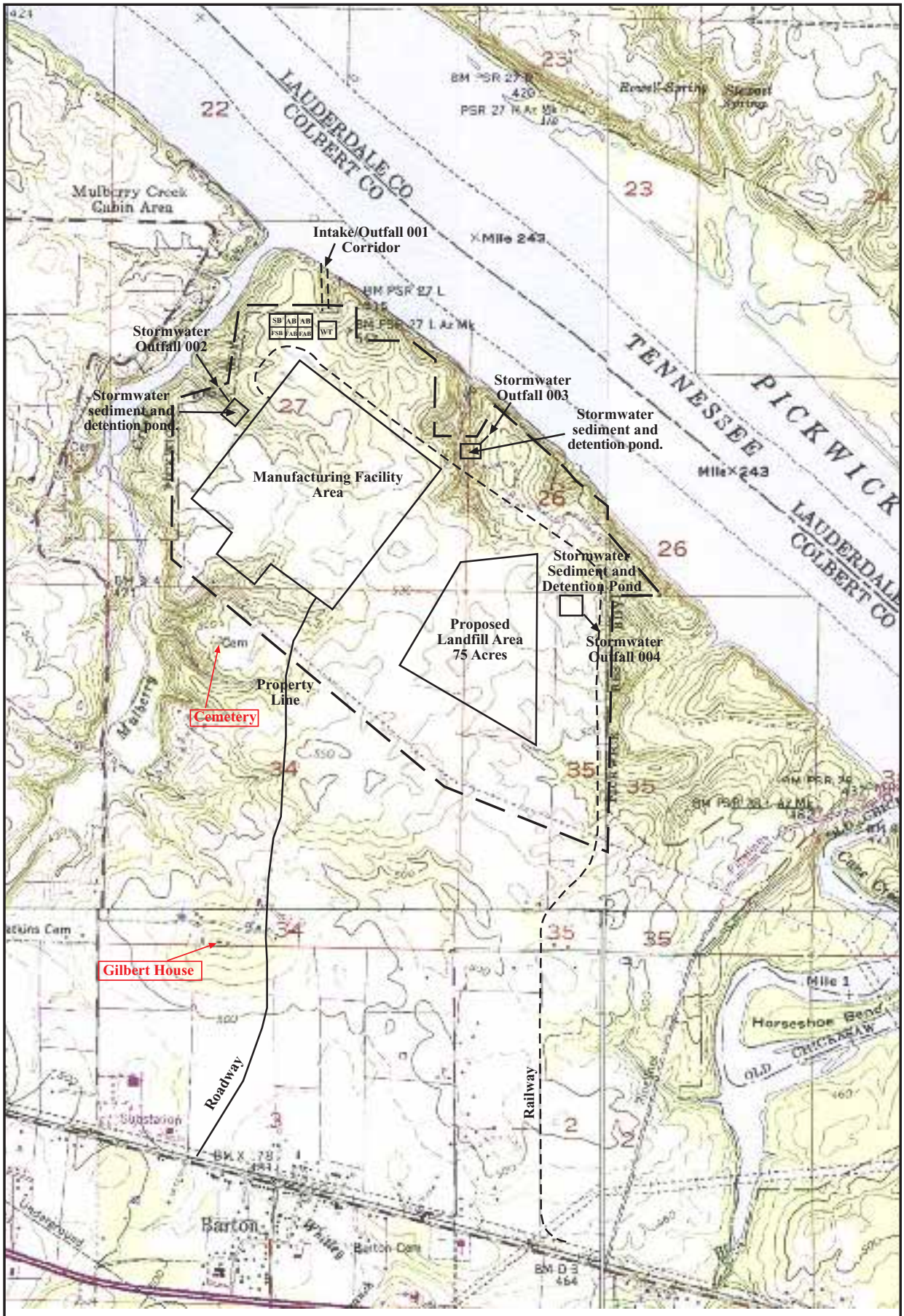
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 February 2002

51840\Fig3.1-3.DWG PLOT DATE: 04\26\2002



EARTH TECH

Figure 3.1-3
Roadway Corridor at Whitley Branch
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 April 2002



= Historical Sites
SB = Sedimentation Basin
AB = Aeration Basin
FAB = Future Aeration Basin
FSB =Future Sedimentation Basin
WT = Water Treatment

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

Figure 3.5-1
Historical Sites

Proposed Barton, Alabama Facility
Southeast Tissue Company LLC

Project No. 51840 January 2002

Fig. 3.5-1-Historical Sites. 51840

Table 2.1-1
Projected EPA Categorical Based Effluent Limitations
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Construction Phase	Total Production Level			EPA Categorical Effluent Limitations					
				BOD (lbs/day)		TSS (lbs/day)		pH	
	Average Accumulative Total			30-day Average	Daily Maximum	30-day Average	Daily Maximum		
	tons/year	tons/day	lbs/day					Min	Max
Phases I, II, and III	110,000	306	611,111	3,178	5,867	4,156	8,006	5.0	9.0
Phase IV	180,000	500	1,000,000	5,200	9,600	6,800	13,100	5.0	9.0
Phase V	290,000	806	1,611,111	8,378	15,467	10,956	21,106	5.0	9.0
Phase VI	360,000	1,000	2,000,000	10,400	19,200	13,600	26,200	5.0	9.0

Number of operating days = 360 days/year for average production.
Total wastewater flow - Phases I - III: 3.3 MGD
Total wastewater flow - Phases I - IV: 5.5 MGD
Total wastewater flow - Phases I - V: 8.8 MGD
Total wastewater flow - Phases I - VI: 11.0 MGD

BOD - biochemical oxygen demand
TSS - total suspended solids

Table 2.1-2
Predicted Concentrations in Discharge at NPDES Outfall 001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Predicted Wastewater Discharge Concentration		Believed Present	Believed Absent
		Maximum Daily Value	Long Term Average Value		
EPA Form 3510-2C, Section V, Part A Pollutants:					
Biochemical Oxygen Demand (BOD)		*			
Chemical Oxygen Demand (COD)	mg/L	400	300		
Total Organic Carbon (TOC)	mg/L	150	100		
Total Suspended Solids (TSS)		*			
Ammonia (as N)	mg/L	< 5	< 2		
Temperature (winter)	^{o}C	26			
Temperature (summer)	^{o}C	37			
pH	standard units	6 - 9			
EPA Form 3510-2C, Section V, Part B Pollutants:					
Bromide	mg/L	< 1		X	
Chlorine, total residue	mg/L	< 0.05			X
Color	Pt-Co		150	X	
Fecal coliform					X
Fluoride	mg/L	0.25		X	
Nitrate-nitrite (as N)	mg/L	5		X	
Nitrogen, total organic (as N)	mg/L	10		X	
Oil and grease	mg/L	< 5		X	
Phosphorus (as P), total	mg/L	1.5	0.5	X	
Radioactivity, alpha, total					X
Radioactivity, beta, total					X
Radioactivity, radium, total					X
Radioactivity, radium 226, total					X
Sulfate (as SO_4)	mg/L	800		X	
Sulfide (as S)	mg/L	< 0.5		X	
Sulfite (as SO_3)	mg/L	< 2		X	
Surfactants	mg/L	1		X	
Aluminum, total	mg/L	1		X	
Barium, total	mg/L	< 0.05		X	
Boron, total	mg/L	< 0.1		X	
Cobalt, total	mg/L	< 0.015		X	
Iron, total	mg/L	1		X	
Magnesium, total	mg/L	20		X	
Molybdenum, total	mg/L	< 0.05		X	
Manganese, total	mg/L	0.1		X	
Tin, total	mg/L	< 0.02			X
Titanium, total	mg/L	< 0.01			X
EPA Form 3510-2C, Section V, Part C Pollutants - Metals, Cyanide, and Total Phenols:					
Antimony, total	mg/L	< 0.006			X
Arsenic, total	mg/L	< 0.002			X

Table 2.1-2
Predicted Concentrations in Discharge at NPDES Outfall 001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Predicted Wastewater Discharge Concentration		Believed Present	Believed Absent
		Maximum Daily Value	Long Term Average Value		
EPA Form 3510-2C, Section V, Part C Pollutants - Metals, Cyanide, and Total Phenols (continued):					
Beryllium, total	mg/L	< 0.001			X
Cadmium, total	mg/L	< 0.001		X	
Chromium, total	mg/L	0.01		X	
Copper, total	mg/L	0.02		X	
Lead, total	mg/L	< 0.005		X	
Mercury, total	mg/L	< 0.0002			X
Nickel, total	mg/L	< 0.02			X
Selenium, total	mg/L	< 0.002			X
Silver, total	mg/L	< 0.001			X
Thallium, total	mg/L	< 0.001			X
Zinc, total	mg/L	0.03		X	
Cyanide, total	mg/L	0.03		X	
Phenols, total	mg/L	0.02		X	
EPA Form 3510-2C, Section V, Part C Pollutants - Dioxin:					
2,3,7,8-Tetrachlorodibenzo-p-dioxin					X
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Volatile Compounds:					
Acrolein	ug/L	< 5			X
Acrylonitrile	ug/L	< 2			X
Benzene	ug/L	< 2			X
Bis(chloromethyl)ether					X
Bromoform	ug/L	< 2			X
Carbon tetrachloride	ug/L	< 2			X
Chlorobenzene	ug/L	< 2			X
Chlorodibromomethane	ug/L	< 2			X
Chloroethane	ug/L	< 2			X
2-Chloroethylvinyl ether					X
Chloroform	ug/L	50		X	
Dichlorobromomethane	ug/L	< 2			X
Dichlorodifluoromethane	ug/L	< 2			X
1,1-Dichloroethane	ug/L	< 2			X
1,2-Dichloroethane	ug/L	< 2			X
1,1-Dichloroethylene	ug/L	< 2			X
1,2-Dichloropropane	ug/L	< 2			X
1,3-Dichloropropylene	ug/L	< 2			X
Ethylbenzene	ug/L	< 2			X
Methyl bromide	ug/L	< 2			X
Methyl chloride	ug/L	< 2			X
Methylene chloride	ug/L	< 2			X
1,1,2,2-Tetrachloroethane	ug/L	< 2			X

Table 2.1-2
Predicted Concentrations in Discharge at NPDES Outfall 001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Predicted Wastewater Discharge Concentration		Believed Present	Believed Absent
		Maximum Daily Value	Long Term Average Value		
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Volatile Compounds (continued):					
Tetrachloroethylene	ug/L	< 2			X
Toluene	ug/L	< 2			X
1,2-Trans-dichloroethylene	ug/L	< 2			X
1,1,1-Trichloroethane	ug/L	< 2			X
1,1,2-Trichloroethane	ug/L	< 2			X
Trichloroethylene	ug/L	< 2			X
Trichlorofluoromethane	ug/L	< 2			X
Vinyl chloride	ug/L	< 2			X
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Acid Compounds:					
2-Chlorophenol	ug/L	< 5			X
2,4-Dichlorophenol	ug/L	< 5			X
2,4-Dimethylphenol	ug/L	< 5			X
4,6-Dinitro-o-cresol					X
2,4-Dinitrophenol	ug/L	< 5			X
2-Nitrophenol	ug/L	< 5			X
4-Nitrophenol	ug/L	< 5			X
P-Chloro-m-cresol					X
Pentachlorophenol	ug/L	< 5			X
Phenol	ug/L	< 5			X
2,4,6-Trichlorophenol	ug/L	< 5			X
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Base/Neutral Compounds:					
Acenaphthene	ug/L	< 5			X
Acenaphtylene	ug/L	< 5			X
Anthracene	ug/L	< 5			X
Benzidine	ug/L	< 50			X
Benzo(a)anthracene	ug/L	< 5			X
Benzo(a)pyrene	ug/L	< 5			X
3,4-Benzofluoranthene	ug/L	< 5			X
Benzo(ghi)perylene	ug/L	< 5			X
Benzo(k)fluoranthene	ug/L	< 5			X
Bis(2-chloroethoxy)methane	ug/L	< 5			X
Bis(2-chloroethyl)ether	ug/L	< 5			X
Bis(2-chloroisopropyl)ether	ug/L	< 5			X
Bis(2-ethylhexyl)phthalate	ug/L	25		X	
4-Bromophenyl phenyl ether	ug/L	< 5			X
Butyl benzyl phthalate	ug/L	< 5			X
2-Chloronaphthalene	ug/L	< 5			X
4-Chlorophenyl phenyl ether	ug/L	< 5			X
Chrysene	ug/L	< 5			X

Table 2.1-2
Predicted Concentrations in Discharge at NPDES Outfall 001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Predicted Wastewater Discharge Concentration		Believed Present	Believed Absent
		Maximum Daily Value	Long Term Average Value		
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Base/Neutral Compounds (continued):					
Dibenzo(a,h)anthracene					X
1,2-Dichlorobenzene	ug/L	< 5			X
1,3-Dichlorobenzene	ug/L	< 5			X
1,4-Dichlorobenzene	ug/L	< 5			X
3,3'-Dichlorobenzidine	ug/L	< 5			X
Diethyl phthalate	ug/L	< 5			X
Dimethyl phthalate	ug/L	< 5			X
Di-n-butyl phthalate	ug/L	< 5			X
2,4-Dinitrotoluene	ug/L	< 5			X
2,6-Dinitrotoluene	ug/L	< 5			X
Di-n-octyl phthalate	ug/L	< 5			X
1,2-Diphenylhydrazine (as azobenzene)	ug/L	< 5			X
Fluoranthene	ug/L	< 5			X
Fluorene	ug/L	< 5			X
Hexachlorobenzene	ug/L	< 5			X
Hexachlorobutadiene	ug/L	< 5			X
Hexachlorocyclopentadiene	ug/L	< 5			X
Hexachloroethane	ug/L	< 5			X
Indeno(1,2,3-cd)pyrene	ug/L	< 5			X
Isophorone	ug/L	< 5			X
Naphthalene	ug/L	< 5			X
Nitrobenzene	ug/L	< 5			X
N-Nitrosodimethylamine	ug/L	< 5			X
N-Nitrosodi-n-propylamine	ug/L	< 5			X
N-Nitrosodiphenylamine	ug/L	< 5			X
Phenanthrene	ug/L	< 5			X
Pyrene	ug/L	< 5			X
1,2,4-Trichlorobenzene	ug/L	< 5			X
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Pesticides:					
Aldrin	ug/L	< 0.008			X
alpha-BHC	ug/L	< 0.003			X
beta-BHC	ug/L	< 0.004			X
gamma-BHC	ug/L	< 0.004			X
delta-BHC	ug/L	< 0.003			X
Chlordane	ug/L	< 0.23			X
4,4'-DDT	ug/L	< 0.007			X
4,4'-DDE	ug/L	< 0.008			X
4,4'-DDD	ug/L	< 0.007			X
Dieldrin	ug/L	< 0.007			X

Table 2.1-2
Predicted Concentrations in Discharge at NPDES Outfall 001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Predicted Wastewater Discharge Concentration		Believed Present	Believed Absent
		Maximum Daily Value	Long Term Average Value		
EPA Form 3510-2C, Section V, Part C Pollutants - GC/MS Fraction - Pesticides (continued):					
alpha-Endosulfan	ug/L	< 0.004			X
beta-Endosulfan	ug/L	< 0.006			X
Endosulfan sulfate	ug/L	< 0.007			X
Endrin	ug/L	< 0.006			X
Endrin aldehyde	ug/L	< 0.007			X
Heptachlor	ug/L	< 0.007			X
Heptachlor epoxide	ug/L	< 0.006			X
PCB - 1242	ug/L	< 0.12			X
PCB - 1254	ug/L	< 0.12			X
PCB - 1221	ug/L	< 0.12			X
PCB - 1232	ug/L	< 0.12			X
PCB - 1248	ug/L	< 0.12			X
PCB - 1260	ug/L	< 0.12			X
PCB - 1016	ug/L	< 0.12			X
Toxaphene	ug/L	< 0.12			X

1 - Constituent concentrations are taken from EPA Form 3510-2C, Section V - Intake and Effluent Characteristics.
* See EPA Categorical Effluent Limitations for all four phases of production in Table 1.7-1.

Table 2.1-3
Chemical Storage
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Area	Phase	Location	Description	Capacity Gallons
Paper Machine	Phase II and IV	Outside	Tank, Wet Strength Resin Storage	13,505
Pulping	Phase I - III	Inside	Tank, DAF Polymer Day	300
Pulping	Phase IV	Inside	Tank, DAF Polymer Day	300
Pulping	Phase II and IV	Outside	Tank, Hydrosulfite Storage	25,000
Pulping	Phase II and IV	Outside	Tank, 50% Caustic	11,838
Waste Treatment	Phase II and IV	Outside	Tank, Defoamer Feed, Post-Treatment	55
Waste Treatment	Phase II and IV	Outside	Tank, Defoamer Feed, Pre-Treatment	55
Waste Treatment	Phase II and IV	Outside	Tank, Phosphoric Acid Feed	7,046
Waste Treatment	Phase II and IV	Outside	Tank, Aqueous Ammonia Feed	11,838
Water Supply	Phase II and IV	Outside	Tank, Caustic Storage	10,992
Water Supply	Phase II and IV	Outside	Tank, Alum Storage	9,947
Water Supply	Phase II and IV	Outside	Tank, Hypochlorite Storage	11,838
Paper Machine	Phase II and IV	Inside	Tank, Release Agent Storage	7,046
Paper Machine	Phase II and IV	Inside	Tank, Dryer Coating Storage	564
Paper Machine	Phase II and IV	Inside	Tank, Dryer Coating Mix	564
Paper Machine	Phase II and IV	Inside	Tank, Solvent Storage	5,073
Paper Machine	Phase II and IV	Inside	Tank, Defoamer Day	220
Paper Machine	Phase II and IV	Inside	Tank, Defoamer Storage	12,683
Paper Machine	Phase II and IV	Inside	Tank, Spray Boom Day	202
Pulping	Phase II and IV	Inside	Tank, Descalent	300
Pulping	Phase II and IV	Inside	Tank, Stickies Control Agent	9,395
Pulping	Phase II	Inside	Tank, Surfactant Day	1,691
Pulping	Phase IV	Inside	Tank, Surfactant Day	1,691
Pulping	Phase II and IV	Inside	Tank, 5% Caustic	1,691
Boiler	Phase II and IV	Outside	Tank, Fuel Oil No. 2	40,000

(1) Hypochlorite will be used as necessary for control of algae and other biological growth within process water system. Will not be used for brightening.

Table 2.1-4
Outfall Plume Modeling Results
Intake/Outfall Alternatives
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

	Alternative Outfall Location	River Flow (cfs)	River Temp (Deg. F)	Discharge (mgd)	Discharge Temp (Deg. F)	Attachment Distance to Model Left Bank (Ft)	Dilution @ Left Bank	Temp @ Left Bank (Deg. F)	Outfall Distance From Mulberry Creek	Dilution Factor Of Plume As It Passes Mulberry Creek	Temp @ Mulberry Creek (Deg F)	Comments
SUMMER	Alt 1 - Present Location	11,000	86.0	11	98.6	1,201 feet or 366 meters	68	86.2	634 feet or 193 meters	60.0	86.2	7Q10 river flow used. Plume hits left bank of main river channel about 567 feet downstream of Mulberry Creek. Plume approx 60 meters (196 feet) to right of left bank of main river channel at mouth of Mulberry Creek.
SUMMER	Alt 2 - Upstream Location	11,000	86.0	11	98.6	2,474 feet or 754 meters	96.0	86.1	1,320 feet or 402 meters	78.5	86.2	7Q10 river flow used. Plume hits left bank of main river channel about 1,154 feet downstream of Mulberry Creek. Plume approx 100 meters (328 feet) to right of left bank of main river channel at mouth of Mulberry Creek.
WINTER	Alt 1 - Present Location	11,000	43.0	11	78.8	1,850 feet or 564 meters	76	43.5	634 feet or 193 meters	55.0	43.6	7Q10 river flow used. Plume hits left bank of main river channel about 1216 feet downstream of Mulberry Creek. Plume approx 100 meters (328 feet) to right of left bank of main river channel at mouth of Mulberry Creek.
WINTER	Alt 2 - Upstream Location	11,000	43.0	11	78.8	3,940 feet or 1,200 meters	142.0	43.3	1,320 feet or 402 meters	77.0	43.5	7Q10 river flow used. Plume hits left bank of main river channel about 2,620 feet downstream of Mulberry Creek. Plume approx 150 meters (490 feet) to right of left bank of main river channel at mouth of Mulberry Creek.
SUMMER	Alt 1 - Present Location	5,500	86.0	11	98.6	1,939 feet or 591 meters	80	86.2	634 feet or 193 meters	53.0	86.2	Low river flow of 5,550 CFS used. Plume hits left bank of main river channel about 1,305 feet downstream of Mulberry Creek. Plume approx 70 meters (230 feet) to right of left bank of main river channel at mouth of Mulberry Creek.
SUMMER	Alt 2 - Upstream Location	3,250	86.0	11	98.6	Not Attached To Left Bank	N/A	N/A	1,320 feet or 402 meters	56.0	86.2	Low river flow of 3,250 CFS used. Plume approx 275 meters (900 feet) to right of left bank of main river channel at mouth of Mulberry Creek.

Table 2.3-1
Site Selection Criteria Results
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Criteria	Site Location		
	Georgia	North Carolina	Alabama
Criterion 1	Yes	Yes	Yes
Criterion 2	No	Yes	Yes
Criterion 3	Yes	Yes	Yes
Criterion 4	Yes	Yes	Yes
Criterion 5	Yes	Yes	Yes
Criterion 6	No	Partial	Yes
Criterion 7	Yes	Yes	Yes
Criterion 8	No	Partial	Yes

Yes – Met Criterion

No – Criterion Not Met

Partial – All aspects of criterion not met, or probability of meeting criterion relatively low.

Table 2.4-1
Comparison of Proposed Action and No Action Alternatives Effects
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Environmental Component	Proposed Action		No Action	
	Effect	Significant Effect	Effect	Significant Effect
Topography and Climate	0	No	0	No
Geology and Soils	0	No	0	No
Surface Water	-	No	0	No
Flood Plain	-	No	0	No
Wetlands	-	No	0	No
Navigation	-	No	0	No
Groundwater	0	No	0	No
Water Supply and Drinking Water	0	No	0	No
Land Use	-	No	0	No
Air Quality	-	No	0	No
Terrestrial Ecosystem	-	No	0	No
Aquatic Ecosystem	-	No	0	No
Socioeconomic Conditions	+	No	-	No
Noise	-	No	0	No
Archeological/Historical Resources	0	No	0	No

Key to Ratings:
+ = Beneficial effect
0 = No effect
- = Adverse effect

Table 3.1-1
Water Quality Parameters
Summary of 2000 Vital Signs Monitoring of Pickwick Reservoir
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Parameter	No. of Samples	Units	Mean	Minimum	Maximum
Pickwick Transition Zone (TRM 230.0)					
Temperature	62	deg C	24.7	15.8	30.6
Dissolved oxygen	62	mg/L	7.1	4.5	10.3
pH	62	s.u.	7.6	7.0	8.5
Conductivity	62	us/cm	161	144	183
Organic nitrogen	6	mg/L	0.38	0.30	0.54
Ammonia nitrogen	6	mg/L	0.03	0.01	0.06
Nitrate + nitrite nitrogen	6	mg/L	0.27	0.01	0.62
Total nitrogen (TN)	6	mg/L	0.68	0.41	0.98
Total phosphorus (TP)	6	mg/L	0.057	0.045	0.067
TN/TP ratio	6	-	12.1	6.8	17.6
Chlorophyll-a	6	ug/L	13.3	3.0	29.0
Total organic carbon (TOC)	6	-	3.1	2.7	3.4
Secchi depth	6	m	1.20	0.70	1.40
Pickwick Forebay (TRM 207.3)					
Temperature	94	deg C	24.9	15.6	31.1
Dissolved oxygen	94	mg/L	6.1	0.5	9.0
pH	94	s.u.	7.4	6.7	8.7
Conductivity	94	us/cm	156	133	281
Organic nitrogen	6	mg/L	0.41	0.31	0.54
Ammonia nitrogen	6	mg/L	0.03	0.01	0.07
Nitrate + nitrite nitrogen	6	mg/L	0.2	0.01	0.60
Total nitrogen (TN)	6	mg/L	0.62	0.43	0.93
Total phosphorus (TP)	6	mg/L	0.057	0.039	0.070
TN/TP ratio	6	-	10.9	6.6	15.5
Chlorophyll-a	6	ug/L	12.3	3.0	20.0
Total organic carbon (TOC)	6	-	3.2	2.7	3.4
Secchi depth	6	m	1.40	0.80	1.90

Table 3.1-2
National Ambient Air Quality Standards (NAAQS)
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Pollutant	Averaging Period	Primary NAAQS*	Secondary NAAQS*
SO_2	3-Hour	None	1300
	24-Hour	365	None
	Annual	80	None
PM_{10}	24-Hour	150	150
	Annual	50	50
$PM_{2.5}$	24-Hour	65	65
	Annual	15	15
NO_2	Annual	100	100
CO	1-Hour	40,000	40,000
	8-Hour	10,000	10,000
O_3	1-Hour	235 (.12 ppm)	235 (.12 ppm)
Pb	Quarterly	1.5	1.5

*- Expressed in $\mu g/m^3$, unless otherwise noted.

Table 3.2-1
Fish Species Identified in Pickwick Reservoir
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Major Group	Family	Common name	Scientific name
Temperate Basses	Moronidae	Striped bass	*Morone saxatilis*
		White bass	*Morone chrysops*
		Yellow bass	*Morone mississippiensis*
Black Basses	Centrarchidae	Largemouth bass	*Micropterus salmoides*
		Smallmouth bass	*Micropterus dolomieu*
		Spotted bass	*Micropterus punctulatus*
Sunfish	Centrarchidae	Bluegill	*Lepomis macrochirus*
		Green sunfish	*Lepomis cyanellus*
		Longear sunfish	*Lepomis megalotis*
		Redear sunfish	*Lepomis microlophus*
		Warmouth	*Lepomis gulosus*
Crappie	Centrarchidae	White crappie	*Pomoxis annularis*
Catfish	Ictaluridae	Black bullhead catfish	*Ameiurus melas*
		Blue catfish	*Ictalurus furcatus*
		Channel catfish	*Ictalurus punctatus*
		Flathead catfish	*Pylodictis olivaris*
		Yellow bullhead catfish	*Ameiurus natalis*
Gars	Lepisosteidae	Spotted gar	*Lepisosteus oculatus*
Herring & Shad	Clupeidae	Gizzard shad	*Dorosoma cepedianum*
		Skipjack herring	*Alosa chrysochloris*
		Threadfin shad	*Dorosoma petenense*
Minnows	Cyprinidae	Common carp	*Cyprinus carpio*
		Emerald shiner	*Notropis atherinoides*
		Spotfin shiner	*Cyprinella whipplei*
Silversides	Atherinidae	Brook silverside	*Labidesthes sicculus*
Suckers	Catostomidae	Spotted sucker	*Minytrema melanops*
		Northern hog sucker	*Hypentelium nigricans*
		River carpsucker	*Carpiodes carpio*
		Golden redhorse	*Moxostoma erythrurum*
		River redhorse	*Moxostoma carinatum*
		Silver redhorse	*Moxostoma anisurum*
		Shorthead redhorse	*Moxostoma macrolepidotum*
		Smallmouth buffalo	*Ictiobus bubalus*
Perches/ Darters/ Sauger	Percidae	Logperch	*Percina caprodes*
		Sauger	*Stizostedion canadense*
Drums	Sciaenidae	Freshwater drum	*Aplodinotus grunniens*

Table 3.2-2
Endangered, Threatened, and Rare Species in the Site Vicinity [A]
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Major Group	Scientific Name	Common Name	Federal Status[B]	State Status[C]	TNC State Rank[D]	Quad[E]	County[E]	Last Observed[E]	Element Occurrence Data[E]	Preferred Habitat	Key to Map[F]
Terrestrial Species											
Vascular Plant	*Arabis georgiana*	Georgia rock-cress	C		S2	Cherokee	Lauderdale	1975	In 1995 search, not found at previous location.	Rock outcrops; rocky bluffs along watercourses; sandy, eroding river banks	1
Vascular Plant	*Dicentra cucullaria*	Dutchman's breeches			S2	Pride	Colbert	1953	--	Rich, moist woods	2
Mammal	***Myotis grisescens***	**gray bat**	**LE**	**SP**	S2	Cherokee	Colbert	1999	--	Caves for roosting and	3
						Pride	Colbert	1998	June1998: Less than 20 bats noted. Bats were present 4 previous summers.	hibernation; open water for overwater foraging along rivers and lakes	2
						Pride	Lauderdale	1999	--		4
						Sinking Creek	Lauderdale	1998	Key Cave, reported used by a summer colony		5
Bird	***Haliaeetus leucocephalus***	**bald eagle**	**PS:LT, PDL**	**SP**	S3B	Sinking Creek	Lauderdale	1990	Nest unsuccessfully incubated – no eaglets	Large lakes, rivers, coasts	6
Aquatic Species											
Fish	***Elassoma alabamae***	**spring pygmy sunfish**		**SP**	S1	Cherokee	Lauderdale	1937	--	Springs and spring runs usually with heavy growths of aquatic vegetation	7
Fish	***Etheostoma tuscumbia***	**Tuscumbia darter**		**SP**	S2	Cherokee	Lauderdale	1937	Two specimens	Ponded areas of limestone springs with very good water quality and heavy growths of aquatic vegetation	7
Mussel	*Fusconaia subrotunda*	long-solid			S1	Pride	Lauderdale	1997	1 alive	Large rivers, sand& gravel substrate, in current, depths 2 ft in riffles to 12-15 ft	4
						Pride	Lauderdale & Colbert	1998	1 alive		4
Mussel	***Lampsilis abrupta***	**pink mucket**	**LE**	**SP**	S1	Pride	Lauderdale & Colbert	1998	1 alive, female; 1 relic male	Shallow gravel and sand substrate of large rivers;	4
						Pride	Lauderdale	1997	--	rivers with rocky bottom, swift current	8

Table 3.2-2
Endangered, Threatened, and Rare Species in the Site Vicinity [A]
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Major Group	Scientific Name	Common Name	Federal Status[B]	State Status[C]	TNC State Rank[D]	Quad[E]	County[E]	Last Observed[E]	Element Occurrence Data[E]	Preferred Habitat	Key to Map[F]
Mussel	*Pleurobema cordatum*	Ohio pigtoe			S2	Pride	Lauderdale	1997	2 alive	Sections of large rivers with strong current and firm substrate of sand & gravel; not well adapted to impounded reservoirs.	4
						Pride	Lauderdale & Colbert	1998	1 alive		4
						Pride	Lauderdale	1997; 1998	1 alive; 3 alive		8
Mussel	***Pleurobema plenum***	**rough pigtoe**	**LE**	**SP**	S1	Cherokee	Lauderdale & Colbert	1998	1 weathered dead	Large rivers, 12-15 feet deep, in firmly packed gravel & sand	7
						Pride	Colbert	1982	27 individuals		8
						Pride	Lauderdale & Colbert	1998	1 alive (25+ years old)		4
Mussel	***Pleurobema rubrum***	**pyramid pigtoe**		**SP**	S2	Pride	Lauderdale	1997	--	Rivers with strong current, firm sand & gravel substrate, at depths of 3 to 20 feet	4
Mussel	***Plethobasus cicatricosus***	**white wartyback**	**LE**	**SP**	S1	Pride	Lauderdale	1997	2 alive	Shoals and riffles of large rivers in gravel	4
						Pride	Colbert	1997	1 alive		4
Mussel	***Plethobasus cyphyus***	**sheepnose**		**SP**	S1	Pride	Lauderdale & Colbert	1998	1 alive (5 years old)	In reservoirs, occurs to 12 to 15 feet, prefers gravel or coarse sand & gravel substrate	4
Mussel	*Toxolasma lividus lividus*	purple lilliput			S2	Cherokee	Lauderdale & Colbert	1998	1 fresh dead	Prefers gravel, also with mud & sand, in small to medium rivers; has been found on shallow, rocky gravel points & sand bars in a reservoir on the Tennessee River.	7
						Pride	Lauderdale	1997, 1998	3 fresh dead; 1 alive		8
Cave-Obligate Species											
Crustacean	*Cambarus jonesi*	Alabama cave crayfish			S2	Pride	Colbert	--	--	Subterranean waters of caves	2
						Pride	Lauderdale	1976	--		4

Table 3.2-2
Endangered, Threatened, and Rare Species in the Site Vicinity [A]
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Major Group	Scientific Name	Common Name	Federal Status[B]	State Status[C]	TNC State Rank[D]	Quad[E]	County[E]	Last Observed[E]	Element Occurrence Data[E]	Preferred Habitat	Key to Map[F]
Crustacean	*Procambarus pecki*	phantom cave crayfish			S1	Pride	Colbert	1977	--	Subterranean waters of caves	2
						Pride	Lauderdale	1976	--		4
Amphibian	***Gyrinophilus palleucus***	**Tennessee cave salamander**		**SP**	S2	Cherokee	Colbert	1977	Population is large	Subterranean waters of caves	9
						Pride	Colbert	1976	Specimen taken in 1966 from a large pool, 2.5 to 4 feet deep, well within the aphotic zone of a cave at a subsurface depth of about 60 feet.		2
Fish	***Speoplatyrhinus poulsoni***	**Alabama cavefish**	**LE**	**SP**	S1	Pride	Lauderdale	1997	It appears that recruitment is occurring: at least 3 size classes present	Subterranean pools of Key Cave in north bank of Tenn. River	4
Fish	***Typhlichthys subterraneus***	**southern cavefish**		**SP**	S3	Cherokee	Colbert	1977	--	Subterranean pools of caves	9
						Pride	Colbert	1977	--		2
						Pride	Lauderdale	1997	--		4

A Species and data shown were obtained from the list of element occurrences reported by the Alabama Natural Heritage Program database (January 2002) for the four USGS quandrangles surrounding the site: Cherokee (the site is located in the southeast corner of this quad), Sinking Creek, Pride, and Barton. Species were selected for inclusion in this table if they are:

- (1) Federally listed as LE, LT, PE, or PT;
- (2) State protected; or
- (3) Ranked by The Nature Conservancy (TNC) as S1 or S2 in the state of Alabama.

B Definitions of Federal Listed Species Status

LE Listed as Endangered – species in danger of extinction throughout all or a significant portion of its range.
LT Listed as Threatened – species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
PE Proposed Endangered – the species is proposed to be listed as endangered.
PT Proposed Threatened – the species is proposed to be listed as threatened.

Table 3.2-2
Endangered, Threatened, and Rare Species in the Site Vicinity[A]
Southeast Tissue Company LLC
Proposed Recycle Paper Tissue Mill
Barton, Alabama

[B] Definitions of Federal Listed Species Status (Continued)

PS Partial Status – an infraspecific taxon or population has federal status, but the entire species does not – status is in only a portion of the species range.
C Candidate – Species for which the U.S. Fish and Wildlife Service (USFWS) has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened. Development and publication of proposed rules on Candidate taxa are anticipated, and USFWS encourages other agencies to give consideration to such taxa in environmental planning.
PDL Proposed for delisting

[C] Definition of State Listed Species Status

SP State Protected – Species with a state protected status are protected by the Nongame Species Regulation (Section 220-2.92, page 80-84) of the *Alabama Regulations for 1997-1998 on Game, Fish, and Fur Bearing Animals* from the Alabama Deptartment of Conservation and Natural Resources.

[D] Definitions of The Nature Conservancy State Ranking System

S1 Critically imperiled in Alabama because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) of because of some factor(s) making it especially vulnerable to extirpation in Alabama.
S2 Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation in Alabama.
S3 Rare or uncommon in Alabama (on the order of 21 to 100 occurrences).
S3B Uncommon in Alabama during the breeding season (spring/summer)

[E] Data provided by the Alabama Natural Heritage program (January 2002).

[F] Number identifies location of occurrence on map in Figure 3.2-1.

Table 3.3-1
Population of Colbert and Landerdale Counties, Florence MSA, and Alabama
1980-2000
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

	Population		Percent Change**	Population	Percent Change
	1980*	1990*	1980-1990	2000**	1990-2000
Florence MSA	135,065	131,327	-2.8	142,950	8.9
Colbert County	54,519	51,666	-5.2	54,984	6.4
Lauderdale County	80,546	79,661	-1.1	87,966	10.4
Alabama	3,894,000	4,040,000	3.8	4,447,100	10.1

MSA- Metropolitan Statistical Area, includes Colbert and Lauderdale Counties.

* Source: U.S. Bureau of the Census, April 1998. State and Metropolitan Area Data Book 1997-98; A Statistical Abstract Supplement. 5th Edition.

** Source: U.S. Census Bureau, May 2001. Profiles of General Demographic Characteristics 2000; 2000 Census of Population and Housing; Alabama.

Table 3.3-2
Labor and Employment - Florence MSA
1998-2001
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

	1998* (annual)	1999* (annual)	2000* (annual)	December 2001** (monthly)
Labor Force	68,604	66,464	66,911	68,110
Employment	63,779	62,028	63,047	61,580
Unemployment	4,825	4,436	3,864	6,530
Unemployment Rate	7.0	6.7	5.8	9.6

MSA- Metropolitan Statistical Area, includes Colbert and Lauderdale Counties.

* Source: U.S. Bureau of Labor Statistics, January 2002. Bureau of Labor Statistics Data website (data.bls.gov).

** Source: Alabama Department of Industrial Relations, January 2002. Labor Market Information Division website (dir.state.al.us).

- AADT = 9210
- AADT = 9510
- AADT = 10890

Source of Traffic Counts: Alabama Department of Transportation.

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

Figure 3.3-1
2000 Annual Average Daily Traffic Counts
In The Vicinity Of Barton, Alabama

Proposed Barton, Alabama Facility
Earth Tech Project No. 51840 February 2002

51840/ F_2000 traffic count.fh9

Table 4.2
Comparison of Predicted Wastewater Constituent Concentrations to Water Quality Criteria
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Wastewater Discharge Concentration[1]	Estimate of Diluted Concentration in Plume[2]	NRWQC		Alabama Water Quality Criteria		Is Maximum Diluted Plume Concentration > a Criterion?
				Human Health[3]	Ecological[4]	Human Health[5]	Ecological[6]	
Organics:								
Bis(2-ethylhexyl)phthalate	mg/L	0.025	0.00083	0.0018	-	0.0085		No
Chloroform	mg/L	0.05	0.00167	0.0057	-	0.054		No
Phenols, total	mg/L	0.02	0.00067	21	-	21		No
Inorganics:								
Aluminum, total	mg/L	1	0.03333	-	0.087	-	-	No
Chromium, total[7]	mg/L	0.01	0.00033	-	0.011	-	0.011	No
Copper, total	mg/L	0.02	0.00067	1.3	0.0094	1.3	0.012	No
Cyanide, total	mg/L	0.03	0.00100	0.7	0.0052	0.7	0.0052	No
Fluoride	mg/L	0.25	0.00833	-	-	-	-	-
Iron, total	mg/L	1	0.03333	0.3	1	-	-	No
Magnesium, total	mg/L	20	0.66667	-	-	-	-	-
Manganese, total	mg/L	0.1	0.00333	0.05	-	-	-	No
Nitrate-nitrite (as N)	mg/L	5	0.16667	10	-	-	-	No
Nitrogen, total organic (as N)	mg/L	10	0.33333	-	-	-	-	-
Phosphorus (as P), total	mg/L	1.5	0.05000	-	-	-	-	-
Sulfate (as SO_4)	mg/L	800	26.66667	-	-	-	-	-
Zinc, total	mg/L	0.03	0.00100	9.1	0.12	-	0.11	No
Miscellaneous:								
Surfactants	mg/L	1	0.03333	-	-	-	-	-
Total organic carbon (TOC)	mg/L	150	5.00000	-	-	-	-	-
Color	Pt-Co units	150	NA	-	-	-	-	NA
pH	units	6 thru 9	NA	5 thru 9	6.5 thru 9	-	6 thru 8.5	NA

Notes:

Table revised by TVA based on table prepared by Earth Tech

NRWQC - National Recommended Water Quality Criteria. Source: US EPA, April 1999, Office of Water, EPA 822-Z-99-001.

Alabama Water Quality Criteria Source: Toxic Pollutant Criteria Applicable to State Waters, Chapter 335-6-10-07, Code of Alabama, 1975, Amended May 30, 1997.

Table 4.2
Comparison of Predicted Wastewater Constituent Concentrations to Water Quality Criteria
Southeast Tissue Company LLC
Proposed Barton, Alabama Facility

Constituent	Units	Wastewater Discharge Concentration[1]	Estimate of Diluted Concentration in Plume[2]	NRWQC		Alabama Water Quality Criteria		Is Maximum Diluted Plume Concentration > a Criterion?
				Human Health[3]	Ecological[4]	Human Health[5]	Ecological[6]	

1. Effluent maximum daily value (with the exception of color, which is a long-term average value).
2. Estimate of diluted concentration in plume based on a dilution factor of 30 as estimated by TVA, with zero river flow and wastewater discharge of 17.02 CFS at full build-out through Phase VI.
3. Screening criteria are for protection of human health based on consumption of water and organisms.
4. Screening criteria are for protection of freshwater aquatic life, criterion continuous concentration (CCC).
   Hardness-dependent criteria for zinc and copper are calculated using a default hardness value of 100 mg/L as $CaCO_3$.
   Criteria for chromium VI, copper, and zinc are expressed in terms of total recoverable metal.
5. Screening criteria are for protection of human health based on consumption of water and fish.
   Criteria for bis(2-ethylhexyl)phthalate, chloroform, phenol (total), and cyanide are based on current reference dose (RfD) and cancer potency (slope) factors from EPA's online database IRIS (Integrated Risk Information System).
   The only update relative to the RfDs and slope factors presented in the Alabama Water Quality Standards (April 1991) was for chloroform.
   The human health criterion for chloroform was calculated based on the RfD of 0.01 presented in IRIS rather than the slope factor of 0.0061 presented by Alabama.
6. Screening criteria are for the protection of freshwater aquatic life based on chronic exposures.
   Hardness-dependent criteria for zinc and copper are calculated using a default hardness value of 100 mg/L.
7. Ecological screening criteria are based on chromium VI.
8. Human health HRWQC value is based on nitrates.

NA = Not applicable.
- = Not available.